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Lectures

upon

the Institutions

of Medicine

by

William Cullen M.D.

Vol. 4th

London 1784

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of George Washington

to the President

of the United States

in answer to a letter of the 10th inst.

of the 10th inst. of the 10th inst.

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De Disciplina Medica.

Par 1 ad 24.
Gaulii Patholog.

Vide Page 16 Gaulii Pathol.

The Institutions are there Divided into

1st That which treats of health or Physiology.

2^d The condition of the Body in a morbid state;
or Pathology, under which the chief of the Saniotics are
contained.

3^d The doctrine of Means whether pre-
serving Health or curing Diseases.

Pathology. ()

Lect.

In this part we shall follow the Text of Dr. Haubius, endeavouring to correct his errors and supply his deficiencies. His Introduction does not strictly belong to Pathology. When in the beginning of our course we gave a different distribution of the parts of medicine, but we shall here stop to take notice of his distribution.

His first three Paragraphs contain nothing remarkable, but it must be observed he uses the term Nature in different senses. In 1st 5th & 6th Paragraphs he comes nearer to his subject, speaking of the Actions of the Mind, of the Body, & of external Potencies. It was not here necessary to distinguish between the mind and the Body, and the manner in which it is done here tends to lead into error, as supposing some power acting independant of the body. The whole of what he says then is, that in considering the Action of one body on another, we must consider not only the ^{nature} ~~Power~~ of the Agent, but also of the Patient, and that the effects resulting depend in some measure on both. Truly ~~the~~ first application of this which

Vol. 1 and 3A.

needs no comment. I have no objection to Galen's definition of medicine which is not without its faults. It is sufficient to define by its effects without its means unless there is some other definition of the same effect, by different means, and say then that medicine is simply the knowledge of preserving Health and curing diseases. What he says of the ancient Physicians not attending to a Prophecy: *Prædictio* seems a mistake.

In (11) he proceeds to the several parts of medicine. In (12) besides the common condition he mentions also the particular condition of each person, on which subject I have spoken very particularly. As the number of particulars is so great, order is extremely necessary here, and that which he professes is to distribute the parts as they respect Health, or Sickness. One one part ^{healis} *ΥΓΙΕΙΝΗ*, the other *ΙΑΤΡΙΚΗ*.

We have next the division of the first of these in a very enlarged sense. This division is taken from Mr. Locke who proposes it in every Science. But I think if the *ὑγιεινή* be properly understood the next the *ὀψιμορική* follows of course. The *ιατρική* is divided in the same manner.

This Division is very species but of no great use. The whole of the first part is confined merely to avoiding diseases which cannot be done but
by

Dec. 1st 39.

by knowledge of diseases. It is therefore better to 3.
take the whole of the sound state under the head
of Physiology, that of Disease under the head of
Pathology, and the whole doctrine of Means under
the 3^d head of Symplocism. It may be said here the
Semicliths are entirely rejected, but if the Physiolo-
gy & Pathology are properly understood this fol-
lows of course. But further we are not prepared
for the Semicliths till we have a more complete
Nosologia Methodica.

Dr. Haubius adds that the chief foundation of medi-
cine is placed in the nature of man himself; there
being something in the human constitution by
which it self corrects its own deviations.

This is what is properly called Nature, and has
given rise to a multitude of disputes. We shall
not at present discuss this point fully, but only
give what we mean by the Operations of Nature.

We do not imagine that the Human Soul, tho' un-
derstand, is present, then acts independently of the body,
but the whole is carried on by corresponding powers,
which correct their own deviations, as happens in
several Mechanical machines. Thus some means
are provided within us whereby the parts mutually
assist each other. But Dr. Haubius rather
imagines Nature something within us directing
our actions and guarding us from dangers in
the

See ind 3/4.

the same manner as a person who manages a ship directs it which way he pleases, even in opposition to Wind & Tide. Nature is therefore such a Constitution of the human Economy as tends to correct all deviations. We observe something very Analogous to this in vegetables. The two surfaces of a leaf are different in their structure. For particular purposes one surface is exposed to the upper Atmosphere, the other to the earth. If the leaf is twisted so as to have its upper surface under & vice versa, it will restore itself to its former state if it can. If it cannot it turns again in another part and recovers its former state. In the same manner the wounds of Plants are healed their morbid parts thrown off from their sound, & so on in many other respects.

The consideration of Nature taken in this light is really of the utmost consequence, but is pushed much too far by Dr. Galbani.

It is the business of the Physician frequently to correct rather than follow Nature. Not certain too, whether he is right in supposing the practice of Medicine to be originally founded in Imitation of Nature. The proposition too Medeci Natuura Minis-teri, has at least done as much mischief as good. This is pushed to a ridiculous excess by the Galbani.

Dr

(Par. 1 & 3A.

Pathologia Generalis. (Par. 3A & 53,

Dr. Gaubius then proceeds to vindicate the Science from several objections, which part we may pass over as having no immediate connection with Pathology.

Pathologia. page 11

Dr. Gaubius next comes to speak of Pathology more particularly, but uses several terms which cannot be explained at present. He uses the term *Pathologia generalis* for what relates to the general plan of the subject, different from other Pathologists.

Diseases, with their causes &c. are undoubtedly the chief part of Pathology. Such an Introduction as here used is very useful, & nothing leads into more obscurity & Science than confusion of terms. It is in the use of terms is what we last arrive at, and is the effect only of great perfection in Science. It is probable then that the first terms are not proper, and yet we too readily adhere to them, and inquire rather what has been said than what ought to be said. We shall rather follow the last plan. Our language is chiefly got from Galen, and his false distinctions still adhere to it.

Pro. 3A, Ad 53.

The meaning of the term *Morbus* must be the foundation of every other in Pathology. It has been employed in two senses.

I. A Concurrence of Symptoms or apparent Lesions of various parts of the system. This is the most obvious.

II. That state of the body known or supposed on which these Lesions depend. This is the sense in which it is used by Gaubius - but the first Physicians took it in the former & most obvious sense, and some Physicians even now prefer it: Gaubius himself, tho' he has adhered to the systematic writers in his definition, is of another opinion as appears from other parts of his works vide Par. 836, 837, 80, 117, 117. He gives us his Apology in Par. 11, for still adhering to the Rules of the Schools; but with regard to the confusion of Cause & Effect we do not see that it is likely to arise.

Every thing in nature is a series of Links connected together, and it makes no difference whether we call the preceding Link a cause, or the following one an effect. Tho' we consider diseases as apparent Lesions, this doth not preclude us from enquiring into their causes. In Par. 85 he prosecutes this matter further, but the reasons he there adduces may rather be urged against him. Neither doth our definition of disease exclude the term Symptom,

for 34 and 53.

as we shall show in another place, and which may 7.
be considered as parts of the whole. By this defining
diseases from their apparent symptoms we avoid
all danger of error. Thus for instance in the Pleuritis.
If we define it by the symptoms, there is no dan-
ger of such a definition being called in question;
but if we attempt to refine it from the supposed
state of the body at that time, it appears from
Lectures what a number of errors we might
fall into.

It is necessary in our definition to add, that it is
independent of external Impediments & depends
on the body itself. It is sufficient to carry this
along with us in our notion of disease. Dr.
Gubbinus next comes to limit the term, and con-
fines it to diseases of the body, tho' he allows
that affections of the mind may give rise to dis-
eases of the body. May he even seems to go further
in his 37 & 38 Par.

There is some difficulty in fixing this point.
If there are affections or diseases of the mind
absolutely independent of the body, as some
Philosophists think, these we have nothing to do
with. But of the others; the operations of Per-
ception as separate both from Impression and
Contraction are what we call thought; of these
there are a great number of deviations into

Per. 3A. 20 53.

various degrees of folly and vice, to which our Physiology doth not extend. Even the veracious Memory to depend on Mechanism yet as it by no means reduced to any rule; we cannot consider its defects or diseases. We may then reject also those Observations of the Mind which even consistent with our business & way of life, and which are to be corrected by words and not by Medicines.

On the contrary all those Observations which are inconsistent with our common business of Life are to be looked upon as diseases. Further, all Affections of the Mind may be looked upon as remote causes of diseases.

Dr Haubius introduces here his *Principium* a *genuis a morbo distinctum* of which we have spoke before. But may oppose to this the Authority of Boerhaave who asserts that a certain state of the Mind must necessarily follow a determinate state of the body; if this be true we need only to consider the state of the body, in medicine, and attend to the Mind only as connected incidentally with this state.

Haubius next distinguishes *Turbitudines* from diseases, by which he means certain deviations in the Internal Structure of Parts, without giving any apparent impediments of the Functions.

Par. 34. ad 53.

* If they are such as the Recovery of our nature restores
itself & are transitory they are not to be looked
upon as Diseases.

(a) In another place he defines Disease to be
every Deviation from such a state of health as is
ordinary to the Species or Individual, apparent
either to the Patient or Physician, uneasy, per-
manent, & dangerous.

Functions. This further touched on in 123 & 267
 Pr. - These are excluded in our definition, & if
 we admit haubius we must add something
 to it to exclude them. The Qualitates sensibiles
laesae, and Secretarium vitia are two of the parts
 into which Symptoms are divided, and are there.
Turpitudines or vitia. whether these are to be con-
 sidered as diseases or not is perhaps a discretionary
 matter, depending on the degree of uneasiness they
 give, and the possibility of removing them.

We must here make an observation with re-
 gard to Sauvages, who refuses to allow negative
 Symptoms; but his reasoning is by no means
 just, and we must necessarily admit them with
 Linnæus & other Physiologists.

haubius next proceeds to another very consid-
 erable distinction of diseases, viz. with regard to
 the Latitudo Sanctatis. But there must necessa-
 rily be certain deviations from any standard
 of health in our System, nor can we compare one
 man to another in this respect. But even in the
 same man at different times there are consider-
 able differences & deviations from his most perfect
 state of health, which yet cannot be looked upon
 as diseases.* We can now give our definition of
 disease more fully, which we say is an evident,
 uneasy, ⁽²⁾ durable Lesion of the functions depending
 on

28. ad 52.

Par 53 ad 80.

on something in the Body itself. This limits diseases in every part of the distinctions here ordered into.

Gaubius next lays down some rules with regard to the conduct of our Reasoning, in investigating the nature of diseases; but these are only general ones & may be passed over. But he uses expressions here which are only compatible with the Stahlian System. He positively refuses that there are *Molimina Spontanea, nec causa morbi, nec Remedium adhibitis, attribuenda*; and therefore deny his conclusion *Medicinis. Natura ministrat*, and that the whole of the Practice of Physic depends upon an imitation of Nature. Even Gaubius himself is obliged to limit this afterwards, and says that it doth not hold universally in all diseases. We say that the power of Nature as we have explained it before, takes place in some diseases only, and that there is no occasion to limit ourselves to an exact imitation of this power, tho' it merits our attentive consideration.

De Causâ Morbi. Page 22 ad 34.

We now proceed to speak of the causes of diseases. Dr. Gaubius might have omitted his proposition that every disease must have a cause; and his definition

(2) This term is not to be extended beyond those causes that act immediately on the human body. Other causes may modify the action of these causes but the consideration of these doth not belong to Medicine: Thus the action of the Wind acts as a remote cause on the human body, but the cause of its blowing from this or that quarter is a point of Philosophy not Medicine.

definition of cause might be supposed to be understood. A cause is that which is strictly connected with the presence of a thing. Besides these causes there are others, Principia^(a) which imply the Possibility of the Presence of any thing. In investigating causes he observes justly that this enquiry may be carried to a degree of Trivialness: and that it requires some limits. To a knowledge of the first Physical causes are not requisite; nor are these nice distinctions of causes at all necessary. Of the causes of Schoolmen we have retained only the efficient in Physic. In ascertaining the proper division of causes, Dr. Gaubius has rather enquired what has been done this way, than what ought to be done: we shall therefore drop him a little and follow our own course. —

The cause of a disease is, *Status ille Hominis quo fit, ut naturales hominis actiones rite exercentur non possunt.*

A disease itself is, *Status ille Hominis in quo, naturales hominis actiones non exercentur.*

This distinction is simple, obvious, & easily applicable in every case; but if we take Gaubius's definition it is very difficult to distinguish them sometimes. This state of the body which we call a *causa proxima*, is a Link in the chain of cause and

Par. 53 ad 80.

and Effect, and must therefore have also a Cause. 12.

Out of these causes we must consider those that imply the Actuality rather than the Possibility of the presence of the disease - Hence the distinction into Proximate and Remote causes. To avoid ambiguity we might call these Principia. This term is not to be extended beyond those causes that act immediately on the Human body; other causes may modify the Action of these causes, but the consideration of them doth not belong to medicine. Thus the Action of the wind acts as a remote cause on the human body; but the cause of its blowing from this or that quarter is a point of Philosophy not medicine. This is the fundamental distinction, and every other is either subdividing these, or substituting different terms for them. Galbins sh.^d therefore have begun with this & proceeded afterwards to the other divisions; but he has followed the other method which is owing to his false definition of diseases at first.

He is himself apprised of the great importance of this fundamental distinction, and that the proximate Cause deserves our chief Consideration. He seems too in the 67. Par. to take the Causa Proxima in the same sense with us; but he is always embarrassed in speaking of it, in
con;

Chr. 53 ad 80.

consequences of his definition of disease.

Rochdave in defining disease & the Proximate Cause in the same manner as Gaubius does, is obliged to own, that the Proximate Cause is much the same as the disease. Indeed all the Systematics in speaking of Proximate causes are obliged to slide into our notion of disease, tho' in speaking of Remote causes they retain their own.

To proceed now to the Subdivision of Remote Causes. The principal is of Predisposing and Occasional causes. The first of these is improper but has been so long retained that we dare not alter it. Every Effect produced depends partly on the power of the Agent; partly on the Nature of the Subject. Whatever then fits any Individual to be acted upon by particular Agents, and these only which do not act on others, this is called a Predisposition; and when an Agent is fitted to act on particular predispositions, this is an Occasional Cause. Gaubius substitutes the term *Semini-* for predisposition; and *Potentia* receives either for Occasional causes, or for remote causes in general. The inaccuracy of Gaubius in this respect may be found in the 606. Par. where he is talking of *Semini- Naturale*; some of these he says are common and inseparable from

Par. 53 ad 80

from human nature; others proper to Individ:
uals. But the first of these are in the language
of the Mathematicians always given, and there-
fore may be admitted in our Consideration, since
they do not modify the disease at all, or furnish
any Indication of Cure, the whole here depending
on the power of the external Agent. We defined
predisposition to be a particular state in an
Individual, fitting him to be acted upon by particu-
lar Agents; which takes away the necessity
of a *Seminium immune*.

But I must confess there is some difficulty in
apply this doctrine in all cases: thus if 90 out
of 100 are affected by any external cause, we
cannot think here of a *Seminium proprium*. In
the whole what acts on the Subject universally is
not to be called an Occasional Cause. This then
is to be called simply a Remote Cause. Thus the
Contagion giving a Plague acts upon the *Seminium
immune*, & those who escape it do it by some
power of resistance. Accordingly Gaubius very
properly observes, *Occasio Predispositio volumino-
sa nocet*. So the terms Predisposing & Occasional
only proper when used as relatives to each other.

We proceed next to observe another distinction
of Gaubius into Internal & External Causes. - There
is

Pr. 53. 2. 80.

There is no occasion for this distinction, and
Greebaux in this very paragraph 381 uses the
term Internal cause in two different senses.
1.st As predisposing cause. 2.^d As

Must now observe that sometimes there is
some difficulty in ascertaining the Causa Proxima,
as whether it is simple or complex. In Ophthalmi-
mia may be produced by an increased Impetus of
the vessels; but may also be produced by a Relaxa-
tion of these vessels. Gaultier rightly observes
that such a complex proximate cause must
be resolved into its simple parts: But he speaks
of such a complex Proximate cause, as consisting
of several Remote causes which is not our mean-
ing. In Hemoptoe the most common cause is
a rupture of the vessels in the Lungs; we must
still look for the cause of this rupture, as per-
haps too violent exercise, or increased Impetus.
But this increased Impetus may depend on Ple-
thora, and this may be owing to a Suppression
of usual Excretions. So the Causa Proxima
contains every condition of the Body which has
a tendency to produce the several Phenomena.
Therefore tho' we say that the Rupture of the
vessel is the Proximate cause, yet all the
other

Par. 53. ad 80.

(i) " " "

... must be considered as parts of the Proximate Cause.

Hence Boerhaave's definition of the Proximate Cause is just. The *causa Proxima* takes in this comprehensive Sense removes a confusion that we might otherwise fall into by supposing that Proximate and Remote causes are always in opposition to each other, and that a Remote can never become a Proximate Cause. The mobility of the Nervous System is at first a Predisposition, but also an occasional cause concurring and producing Epilepsy, if that mobility continues it must be looked upon as part of the Proximate Cause. But even many of the occasional and simply remote causes, if they continue after the disease is produced, & contribute to the Symptoms of the disease, must be considered as part of the Proximate Cause, since they give us an Indication we must attempt to remove.

A disease has its cause, which should be only the Proximate Cause. This has its Principium, which is a remote cause. This may be either simple or compounded, and in this last case we may use Predisposing and occasional. we could here introduce two new terms, *Principium transiens*, & *permanens*. The *principium transiens* is that which passes away as soon as it has

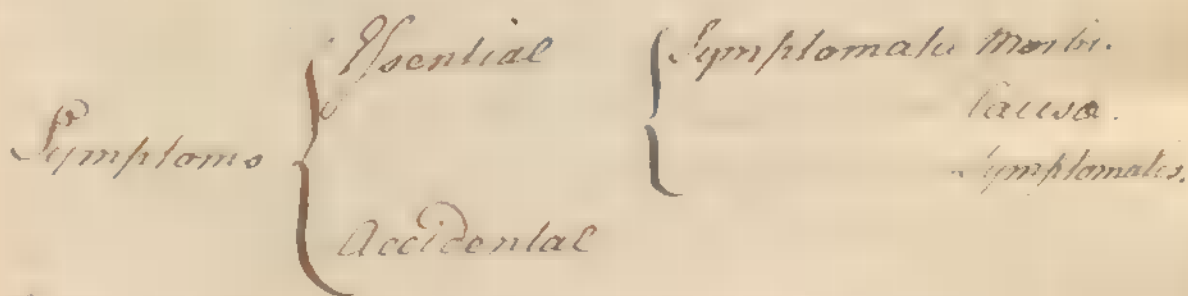
far. 81. ad 119.

produced its Effect. The Principium permanente
is that which still remains and forms a part
of the *causa Proxima*.

De Symptomate. Pages 31 ad 52.

There is no occasion for any great Anxiety in settling this term *Symptom*: It is by use now confined to morbid Appearances, tho' probably equally applicable to that of Health. If Gaubius's Definition we only admit of the first part, and there too by *morbus* we must understand *causa Proxima Morbi*. The term *Santes Symptomatum* is rather Ambiguous.

This division of Symptoms, which is the same as every other Systematic Author, is as follows,



Symptoma morbi est *Symptoma cause Proxima.*
 causa est *causa Remota.*

Symptomatis est when there is such a
 series of external Symptoms as we observe be-
 fore of causes in the *causa Proxima*.

Per. 81. 2 119.

— 112 — 119 1/2

Of these the *Symptomata Morbi* are what properly constitute the disease and chiefly merit our consideration. To illustrate this division, *Stibina* is often the cause of *Spile* ay, and in such fits an *Hæmorrhagia Varium* is a report which is not a *Symptomata Morbi*, but a *Symptoma Cause*. It must be observed however that Physicians have not always adhered to this distinction, but have confounded the *Symptomata Cause* & *Symptomata Morbi* together. The *Symptomata Cause* are frequently not Symptoms but one disease superadded on another. These then may remain after the Primary diseases are gone; and are then to be considered as a separate disease. Thus if both Catarrh and Rheumatism arise from cold, if this last is slight we do not consider it as a disease but as a *Symptoma Cause*. In the same manner an *Angina Scanthematica* often supervenes to the Scarlet fever, and is then to be considered as a *Symptoma Cause*; but if this Angina prove dangerous, it proves of more consequence than the Primary disease.

Symptoma Symptomatis may arise from either of the former. Thus in Catarrh, if in consequence of the cough an *Hæmoptoe* ensue, this is a *Symptoma Symptomatis*. In the Asthma too the Patient

Car. 81. ad 119.

is oft obliged to sit for a long time in an erect posture, which is apt to produce swellings in the Legs, and this must be considered as a Symptomata Symptomatis.

These Symptomata Symptomatum have a very intimate Connection with the Symptomata Cause Præcurre, and tend much to explain both their Nature & Degree. Dr Haubius adds that there may remain after the disease is gone; such a disease having induced a particular state of the body that continues after the disease is gone. Thus Eritismus Symptomatis often follows the measles; Ophthalmia the Small pox, &c. —

Besides these Haubius gives another division of Symptoms taken from the effects of the vires Naturæ Medicalitricæ, of which we have spoken before. These he says are not to be imputed to the Causes of the disease. But in opposition to this we find that in the case of an Abscess, this is a salutary tendency, but it has a reference to the size &c of the extraneous body producing the Abscess. These Molimina Naturæ are equally immediate consequences of the Causes of the disease, and are to be distinguished from other Symptoms only by their tendency, in which respect they may be very justly distinguished. The Secta Naturæ cum Morbo, and other things of that kind lead us only

to

Pro. 81 ad 119.

to a Metaphorical Language, which is apt to deceive us. But this Gaubius inclines more to the opinion of the Sibilians, he doth not go their whole length, but points out the bad consequences of an adherence to their System in that respect.

He next proceeds to this 3^d sort of Symptoms, which he calls, Accidental. A sick person is exposed as well as a healthy one to various accidents, which may be differently modified by the present disease, and will oft have a great effect on the disease, either aggravating it or perhaps changing it entirely. These are called by Physicians the *Enyivomena*, this Gaubius endeavours to limit this term to the *Symptomata Relicta*, or *Molimina* Nature but seemingly without reason.

These Symptoms have not at all an equal weight or importance, hence arises another division of Symptoms into the *Necessaria* & *Non necessaria*. The *Necessaria* are such as are immediately connected with the *Criminale* Cause, and are to be distinguished both from the Accidental Symptoms, *Symptomata Causae*, & *Symptomata Symptomatis*. What are properly the *Non necessaria* is not very easy to say. We may lay down some general Rules on the subject, but it will not be easy to apply them in every particular instance.

There

Par. 81 ad 119.

Par. 120. ad 130.

There is still another subdivision of *Symp-
tomata necessaria* into such as appear from the
very beginning, and subsist in the same form
during the whole course of the disease, & others
that occur in particular periods.

(Pathologia Specialis.

Having now finished the *Pathologia generalis*, we
shall touch upon the distinction of *Generalis* &
Particularis, which Gaubius seems to have introduc-
ed in an improper place.

He divides it into 2 parts at first; the Nature,
Differences, causes & Effects of Diseases; but dif-
ferences constitute a part of their nature; as con-
sequently divided in 3 parts. It will be prop-
erly in this division to treat of the *Causa proxima*;
but if Dr. Gaubius has done it at all it is under
the nature of diseases.

The Pathology is undoubtedly a part of a dogmatic
system which is chiefly investigated by a know-
ledge of the *Proximate cause*. It must treat

I. Of the *Causa Proxima*, or, as Gaubius calls it,
nature of diseases.

II. Of the principles of Diseases, which are the
visus & Potentia proxima of Gaubius. —

Par. 120. ad 130.

Par. 125. ad 130.

III. Of the Symptomata — considered as effects, of the causa proxima; but as diseases consist in a concurrence of different symptoms, so the causa proxima often consists of a concurrence of series of different conditions of the body; each of these conditions then are to be considered separately as far as they can.

These abstract considerations are what Gaubius treats of under the title of morbi simpliciores; but, will be better to consider these not as diseases, but as parts of the causa proxima, and to call them rather affectus simpliciores, by which term even Gaubius calls them in another place.

The three first parts then of Pathology according to Gaubius depends on these affectus simpliciores. But there is occasion for a 4.th part to which the morbi compositi may be referred. Dr. Gaubius is aware of this, and gives another more complete division, first of the affectus simpliciores, then of the affectus compositi. But unluckily there he touches them only as accidental differences, whereas here he introduces differences constituting different genera & species.

We are then first to consider the affectus simpliciores, according to the meaning we have assigned to this term.

The

Par. 125. ad 130.

Par. 130. ad 150.

The first division of these is into the *Contenta* 23.
and *Continentia*, or *Fluids* & *Solids*; the *Solids*
are divided into the *Simplicia* & *terna*, and these
again into the *organica* & *Inorganica*.

Before entering upon the *Solida simplicia*
Gaubius promises

Analysis Chemica generalis corporis humani.

This is Gaubius's account of the Chemical Analysis
of the Animal mixt: he seems scarcely proper
here and I think *Spac. Sauti* very ill executed.
The whole we can discern of the mixture of animal
mixts is this, that it introduces more or less
water into its composition, and that the differ-
ence of parts depends on the different proportions
of water in them. What Gaubius says appears to
be without foundation, and even supposing it
true doth not admit of application. We shall
offer a very simple system on this subject.

The System I have to offer you, Gentlemen, is
a very simple one. In the first place I shall be-
gin with delivering some general propositions
the Truth of which we have not time to prove
in detail.

We begin with supposing that in Nature there
are

Part. 130. & 150.

are properly only two kinds of Matter. One Atoms, or solid indivisible Bodies, of one figure & one size uniformly. The other is a subtile Elastic fluid, by which every Atom is surrounded as by an Atmosphere. These Atoms are consider'd as mists, and their only Influence to be to modify their surrounding Atmospheres. But this we confine to one circumstance, that a certain continuity in any two Atoms diminishes the Elasticity of the Ether interposed between them, and therefore increases it in the parts left more free.

Admitting this we can explain Attraction, for it consists in two Atoms in such Contiguity, that the Ether without them is of greater density than their peculiar surrounding Ether, by which means they are pressed together. All the properties that we can discern in Bodies are to be referred to the two heads, Modes of Attraction, and Modes of Cohesion. For they are all either properties of Aggregates which consist in Modes of Cohesion, or of Mixts which are either to be referred to Cohesion or Attraction. This shows how very important the Proposition delivered above is; but Cohesion & Attraction are greatly diversified. This we imagine depends on the

L. G. Cant

Par. 130. ad 150.

different Arrangement of Atoms applied to each other. 25.

The Atoms in their first Contraction cannot be applied at random, but will be united so, as given numbers are round a Centre. The possible combinations round a Centre are only 6, viz, the Sphere, & 5 regular Solids. In these combinations there must be a different state of Atoms & Ether, and consequently a different force of Attraction. The effects of the different degrees of Density of Ether giving different degrees of Attraction are not yet sufficiently ascertained to allow us to be more particular on this head. In these combinations there must be a different state of Atoms & Ether, & consequently a different force of Attraction. The effects of the different degrees of density, of Ether giving different degrees of Attraction are not yet sufficiently ascertained, to allow us to be more particular on this head. In the next place every view of Nature leads us to believe, that from these Atoms to the Organic matters we see there are constant Lessons & degrees, before we arrive at those higher degrees of Composition with which we are chiefly conversant.

But it has been supposed that these Compounds consist

Par. 130. ad 150.

consist of Elementary parts of the same nature 26.
with the Compound and giving it its properties.
But the Supposition of such Chemical Elements,
is unnecessary & further is contradicted by the
whole Phenomena of Nature.

The most simple combination we see is Adhe-
sion in which the Body suffers no change in its
properties. The next degree of combination is Solu-
tion in which the Body suffers little change ex-
cept in Aggregation. But in mixture we find no
Body Possessed of the same properties with its
ingredients, which overturns the Chemical doctrine
of Elementary parts. But because we can decom-
pose this mixt & recover the former Ingredients
we suppose that the Ingredients contribute to the
Properties of the Compound.

Both Corpuscularians & Chemists have run into
a kind of middle System, supposing that we can by
Decomposition obtain the constituent parts of the
Compound, whereas we can do it only in a few
instances. It is true that we know a little of the
Constituent parts of Salts, little of Inflammables, but
scarcely any thing at all of other Matters. Neither
do we know any thing more of the Constituent
parts of Animal or Vegetable matter, than of Metals
& earths &c. We find all matters presented to us in

272

Par. 130. ad 150.

X He says that the difference of Structure in our Body depends on the different proportions of these Matters, viz his humidum & siccum. But — &c

^{Mineral, animal & Vegetable} Matter resolve into one or other of these forms. 27.
one or other of two or three general forms; they are sup-
posed to be of the same nature. But we know nei-
ther the proportions of these parts nor from the pro-
portions can we judge of the qualities. Many bo-
dies in Resolution resolve themselves into a dif-
ferent form from what they had before. The same
too happens in Combination, so that two bodies
neither of which were inflammable, may on combi-
nation become Inflammable.

We can in very few instances say what are the con-
stituent parts of Bodies Matter. Thus in Mineral &
Vegetable matters we can by a little variety in the Chemi-
cal treatment of them, obtain a different resolution. Neither
has this ever yet led us to discover the particular
properties of any one vegetable. So imperfect is our
method of Philosophizing, and such Dabblers as yet
are we in true Science.

After this general discussion we shall make
only a few Strictures on particular passages in
Gaultier's.*

The Humidum & Siccum is not a fundamental dis-
tinction of Matter; but depends on the mode of Aggre-
gation, and the Combination of two bodies will
give a difference in this respect. He says that the
different structure in our Bodies depends on the
different

different proportion of these matters. It is as a general
 : general proposition is by no means applicable; nor
 is the Siccum in particular a fundamental matter
 or consists of the Species Siccæ mentioned hereafter.
 Siccum, says he, coherens est, which seems to
 me no more than to say coherent Bodies are more
 coherent. But the presumption in this respect,
 when we ascend to the more simple parts of matter,
 lies rather in favour of the fluid. Diamonds, the
 most coherent bodies, appear to have been formed
 from a fluid. In very firm cohesions too, as in
 Metals, still a fluid matter still continues. With
 regard to the Siccum Irenæus we know of no acti:
 : vity in matter, except a disposition to be united
 to another body. Fluidity indeed favours this, but
 fluidity is not exclusive of any kind of matter.
 We would refuse too, Siccum calore æquius diffi:
 : pandum for a general proposition. Thus the ϕ is
 far more volatile than water tho' a dry body. So
 that the whole of it is this, that what remains after
 dissipation is found in coherent mass, which does
 not at all refer to the original parts of this matter.

Leibniz next ventures to give a threefold division.
 But if such a division of Elementary Bodies is to be
 admitted at all, why is air excluded? It may be
 asked too whether air is humid or dry? It seems
 to be the foundation of Fluidity in Water, and
 of

Par. 130. (ad 1A9.

of consistency in facts sometimes, which is very opposite to the chemical notion of elementary parts. In prosecuting this division almost every part of it is contradicted by facts, and is both without foundation & application. What he says of gluten is the same doctrine we criticized in Matter.

From this system he supposes he derives the manner of our nutrition. But several Foods contain all the Elements he mentions here, which yet are not found nutritious. Why is not Vitre equally nutritious with Sugar?

Another Application he proposes is to explain the nature of Putrefaction, but it doth not advance the least step towards explaining the principal Phenomena belonging to it. For how will it, explain that Solution of Air which seems so absolutely necessary to that process? In the whole, Dr Gaubius reasoning on this head is absurd, and serves only to point out the defects of the chemical doctrine of the particular elementary parts of Bodies.

Morbi,
9

150 169.

Morbi. part. Sol. Simplifics. Page 63. Par. 150.

We come now to speak of the several Simple affections of the Human body, in which either singly or in concurrence the proximate causes of diseases consist. We begin with considering the affections of the simple solid, & this, with Gaubius, we call *Linea prima pathologica*. We begin with considering it as different from fluid. This depends on cohesion, for the several matters of which they are composed are quite the same & different only in proportion.

The most simple affections then of a solid, are such as affect its cohesion. His train of thinking of this is not just, for our simple solids may be considered in their rarefaction, cohesion, or mixture; but so far alone as they serve some function of the body, is their cohesion to be considered. The modes of cohesion oft lie in the Elements themselves, and therefore he is too general in saying that such consideration is not at all necessary. But we shall begin with the affection of cohesion.

Cohesion, says he, may be faulty in defect or excess. This consideration leads only to the force of cohesion; but there are many other modes necessary to be considered. He accordingly premises, that all these are to be considered as relative only. He first considers the several species of morbid affections,

150--169.

then their causes.

In his definition of *Debile*, he seems to confound the *Laxum* with the *Debile*, & want of Elasticity with both. Gold & Lead are both soft bodies; but Lead is weak in point of Cohesion, Gold is strong. Gold too differs more from Iron in Elasticity than Lead doth. *Debile* is confined more properly by Boerhaave to the force of Cohesion.

We should chuse to distinguish the species in another manner. Parts of the human body distinguished as *Hard* & *Soft*. In soft parts three morbid affections to be noted. 1.^d *Debile*, which respects the force of Cohesion. 2.^d *Laxity*, when too flexible & yields too much, the Cohesion still remaining entire. — 3.^d where with *Laxity* it wants Elasticity. To the first of these, no morbid affection in the system is opposed; and only faulty in excess when joined with the opposite to *Laxity*, *Rigidum*. There may be an excess of Elasticity too, but this very seldom occurs in Animal fibres. So on the one hand these three already mentioned, and the *Rigidum* on the other are morbid affections of soft parts.

In *Hard* parts, we find these morbid affections, viz, 1.^d *Fragile*, but this may be with a force of Cohesion so as to oppose contraction, yet very readily give to percussion. We may consider it in soft Iron

Iron and Steel, which do not differ much in Cohesion but greatly in their disposition to bear one Strain.

De Gaubius also mentions a Disposition to break, depending on certain singularities in Particles, which he calls *Robustum*.

But besides these relative modes there is the absolutely Hard & Soft, where Softness in the Bones, in whatever degree, is a morbid affection.

I consider them now in Dr Gualtieri's terms. He subdivides *Debile* into two Genus, the first of which he again subdivides into *Laxum*, *Inert*, & *Flexile*. He takes *Laxum* differently from Dr Boerhaave, and it is to be separated from the *Acciduum*, like what we add only to *Flexibility* with *Elasticity*. His instance here is not very happy as it regards Organic fibres. To these degrees of *Laxity* he adds the absolute softness. His second Genus of *Debile* is what he considers as the *Sole* *Debile*. His first species is a *Seminium* & not a morbid affection, except when existing in particular parts, and not in the whole System. His *Tabidum* respects Putrefaction only, but this is improper, and we want a proper general term to express that variety of mixture diminishing the force of Cohesion. This contradicts what Gaubius set out with, that the consideration of the State of Mixture was not necessary to Philo-
sophy.

150... 169.

logy. The next distinguishes between *Fissile* & *Fragile*; but doth this by their manner of breaking longitudinally or transversely. Bodies shrink in their Bulk, as their humidity exhales. If their adhesion then to surrounding Bodies is greater than of their parts to each other; this is one of the Foundations of the *Fissile*. Another from unequal Exhalation, as in humid clay. A 3^d where the parts are of a particular structure and the Force of cohesion is different; as happens in Wood where the cohesion is greater longitudinally than transversely. Gaubius confines himself to this, but we think no such takes place in human bodies. The *Fissures* that occur there are chiefly in the *Epidermis* or *Epithelial* where there is no such fibrous Arrangement. There is one singular fact with regard to *Fissures* in the human body that they observe a particular direction. In case of Union after a wound, the Substance is less firm than it was originally; hence old Ulcers are apt to break out again in the same side & old Injuries voyage.

The *Fragile* here is not to be considered as always in consequence of Inosion. But this is to be opposed to the proper *Fragile*, as *Tenonim* is to *Labidum*. We abstain from the causes of this before

150. 100.

before we have mentioned the Species of *Rigidum*.
 As he uses the term *Rigidum* for all these three Spe-
 cies, he is obliged to invent the new term *Serax*, which
 is the same as the *Rigidum* of Boerhaave. The *Serax*
 is the absolute hardest of all. Whether a *fragile*
album can occur in animal bodies is uncertain.
 By age they grow more vitreous, but we doubt
 whether they ever arrive at the state here spoke of.
 We doubt the Fact of a *Hyperfragiliana*, for this
 probable at this time the Prices continue much the
 same, the sudden falls, Session of muscles, Maudsels
 of blood will fully account for Accidents.

We have given herewith a Table of our Doctrines

Tabula

In explanation of the Table.

In the first place there may be a faultiness in absolute qualities, which are *Durum* in *Molle* & *Flexile* in *Opsitus*. The others are only relative & ought to consider these separately as in the soft or hard parts. The Defects of Cohesion in the soft parts are the *Debile laxum* & *flaccidum*. The first of these admits of a subdivision as depending on the fraility of the Fibre which is the *Concreum* of *Gambius* & the state of the mist which *Gambius* improperly calls *Tabidum*.

On the other side the only defect is *Radum*. In the hard parts the defect of Cohesion gives the *Fragile Spongiosum*, the excess of it the *Fragile Vitreum*.

We have omitted here only the Term *Difile*, which is sometimes to be referred to *Fragile spongiosum*, sometimes to *Fragile vitreum*.

Labula

qua affectus partium solidarum simpliciter separantur.

Cohasionis

Defectus

Relative

Absolute

Perpetuus.

Relative

Flexibile in Octidugulati In part. m. m.

In part. m. m.

Durum.

In part. m. m.

Figurum. In part. m. m.

Debita laxum. & flaccidum.

In part. m. m.

In part. m. m.

* This property belongs to the state of the animal mixed, & not to the
 perfection of the simple solid.

150 169.

We now come to consider the causes that may affect simple Solids, either considered as a simple fibre or as a more organic Structure. This consideration may be referred to 2 heads.

I. The Matter of the Fibre.

II. The Matter given, Circumstances that affect the motion of it's parts on each other.

The causes affecting, affecting the matter of the Simple Solid are those affecting the humidity & the Secum; for the conditions of the Solid differ according to the different proportion of these. Thus if the water is in greater proportion it gives, 1st A weak cohesion, 2^d A greater laxity, 3^d A want of Elasticity in water more Plasticity. —

If we diminish the proportion of water still preserving the Laxity, the Elasticity may be increased, which is a compound Sort of the force of Cohesion & the Flexibility. But as the water is diminished, the force of Cohesion still increases & the Flexibility is diminished; so that it may pass through the state, Laxum, & Rigidum in passing to the Liquidum.

We must now enquire what is in the human body giving these different proportions of humidity & Secum. These are various, as 1st The life

prolonged

150 - 169.

ference of the nutritious matter; it is probable that
this as applied to the solid, is always in a fluid
form; yet due there is some latitude in respect of
it's material fluid state. For in the formation of the
different simple inorganic parts, as the hair, nails,
&c there is a difference of density which seems to
show a difference of fluidity in the nutritious matter.

2^d There may be a difference according to the Ali-
ment taken in. This however is less certain, the Ani-
mal Economy seeming to modify this very variously.
It may also depend on the quantity of Aliment in-
pendant of quality. For as it is always applied in a
fluid form, as more is applied, the greater propor-
tion will there be of the Humidum.

3^d Much depends too on the progress in the growth
of the Body, for the fluid part passes away whilst the
solid is always accumulated. This explains the
Flexibility, the Laxity & Rigidity of the Simple Solids
at the different periods of life. A difficulty occurs here;
that the further this goes on the following accretion
goes on ~~more~~^{less} slowly. We explain it thus, that the
growth of our Solids is not by external adposition
but by a fluid matter insinuating itself into the
Pores of them. In proportion therefore as these be-
come more rigid, this will find more difficulty in
entering.

Ath It is influenced according to the various state
of

150 169.

of the powers expelling the fluid part & condensing the solid. Two of these are the temperature of the surrounding Air, and the degree of Exercise or motion of the Body. Thus Cold favours the concretion of solid Matter. Heat suspends it in Solution & prevents such Concretion. This explains then on the above principles why Animals are so very small in cold Countries. But the Cold expels Humidity it preserves Laxity, and will therefore favour the Insinuation of nutritious Matter. Besides the separation of the Humidity will be much influenced by the Humidity of the surrounding Air. Hence both heat & cold in the extremes give Animals of the same species of a less size than in the Temperate Zones. But the largest size is not found exactly in the middle of the Temperate Zones, but in the parts inclining more towards the S. W.

How Exercise acts is not perhaps very certainly known. Metals can, by hammering, acquire a greater density. We may suppose the same to take place in the motion of our bodies acquiring a greater pressure.

5th There are certain powers determining the effects of nutritious matter, such are the Original Humina which are greatly modified by the

150-169.

above power cannot be entirely changed; what this depends on must be referred to the mystery of Generation; but it is such a power as determines the quality, quantity, & application of the Nutritive matter. But further, the proportion of the Humidum being given, much depends on the nature of the Siccum. Dr. Haubius is mistaken in considering this merely as an Earth. There may be a larger proportion, but neither is this the basis, nor doth the force of cohesion in all probability depend on the Proportions of it.

He dwells too much on the Apposition of foreign matter, without considering the difference of matter, independant of the proportion of Humidum & Siccum. But we know so little of the Animal mist & its changes, it does not admit of much application. So we shall be content with making it out as a general head of the System, tho' Haubius goes further, & assumes several suppositions, which may perhaps be true but may be also false.

We come now to the 2^d head. Amongst these Powers we may reckon Heat & Cold, which modify the Laxity & Rigidity of simple Fibres. But still there are other powers independant of the matter of the Fibres themselves, and these are such as affect the motion of the parts on each other. A
certain

150-169

certain degree of laxity in the Riber between the parts, & the different proportion between this and the Exterior Riber will alter the Elasticity of the parts greatly, if we consider the matter in this view we before gave of cohesion. Both flexibility & elasticity require such a motion. This will first be more or less according to the Flexion or Irritation to which any part has been exposed; for the flexibility of flexible parts is always improved by Exercise. The effects of this in the human system have been sufficiently noticed. Thus we observe that a part becomes rigid if not exercised. This reason however is not exactly applicable, for here muscular fibres are concerned. But it takes place in parts where there is not such a particular Organization, as in Tendons and Ligaments. But the flexibility of these parts depends on their organic structure; so that the rigidity in these cases too doth not depend entirely on the rest of the simple Solid. A more remarkable proof of this is, that a fibre capable just before of Irritation, if kept long in an extended state, on removing the extending power doth not now show contraction.

On the whole then it is obvious, 1st That as flexibility and Elasticity depend on the mobility of parts on each other, so this Mobility depends much on the

150. 169.

the motion to which they have been accustomed, and accordingly Flexibility and Elasticity are much improved by Exercise. In all Flexible & Elastic Bodies, the stretching act less forcibly according as the body is more stretched. Thus double the weight will not stretch a cord twice as far as the original weight; and the power extending the cord must always be increased, in proportion as the Extension is further carried on. As the Constitution & Composition of a fibre being given, & the Motility of the parts on each other, the Tension or Traction of the part will depend on the stretching power.

Our Solid parts are stretched, 1st by stretching powers applied to their extremities, & the whole of the Animal body is so connected that the Tension of the parts is communicated to each other, & this extends over the whole System. - Hence in every strong effort we in some measure bring the whole body into Action, in order to give a proper Tension to the whole. Further, it is peculiar to the Animal System that it contains Tubes distended with fluids circulating through them. The state of the Tension of these vessels from their connection with the surrounding parts has a considerable Influence on the

150-169.

the Tension of the whole System. Further, the
 nervous power impelled in different proportions
 to parts must be another great cause affecting
 the Tension of the System. But further there is
 reason to think that there are particular passages
 for the Air thro' every part of the cellular Mem-
 brane. Senae as we have already observed, sup-
 poses that there is a quantity of Air contained in
 every Membrane of the Body. This Elastic fluid
 probably varied off in its quantity & elasticity from
 internal & still more from external causes, and
 therefore must have great influence in determining
 the Tension of the whole System. There is reason
 then to think, that the state of the Simple solids
 depends more on this Tension than on the Materi-
 als of which it is composed, or any other circumstance.
 But further there are several other Circumstances,
 external extending powers. Such are Heat & Cold
 which are said even to affect the Composition of
 the Fibre itself. But merely by acting upon the
 external parts & thereby varying their Tension the
 Tension of the whole internal System must be
 also varied. Moisture & Dryness too, only as af-
 fecting the surface of the Body, will also affect
 the Tension of the whole System. To this we would
 refer the surprising effects of Cold & warm baths.

150 169.

3. The Pressure of the Atmosphere, by its weight & Elasticity, must act with great power in this way. Thus it enables the vessels to convey & reconvey their proper fluids. It is hard to see how so small an alteration as we see sometimes happens in the prodigious weight of the Atmosphere can produce the changes it does, but *id quod libratum facile movetur*.

A. There are several other External causes, referred to by Gaubius under the obscure title of *Ambientia*. To all these we would add the operation of Emmollient & Astringent Medicines. These as externally applied may be conceived as entering into the composition of the parts. But this notion is embarrassed with many difficulties, and we have occasion to think that Emmollients penetrate no further than the cuticle as was observed of moisture & dryness. & act only by affecting the Tension of the external surface, & by that the Tension of the whole System.

But further, we were to consider Fibres as in a more Organic State: But it is plain that it is impossible to keep these two considerations entirely separate, tho' we have done it in a great measure. Anatomists now allow that most if not all of our Solids are of a Cellular Structure.

150. 169.

Structure. It will then be obvious, that if this cellular texture is liable to any variation, it will greatly affect the Tension and Laxity of the System. Thus if a portion of cellular texture is interposed between the Pleura and external membrane of the Lungs, it induces a degree of Rigidity there. Again, the cellular texture being given, the Laxity of the part will be increased accordingly as this is more filled with an inelastic fluid. This particularly happens if this inelastic fluid is accumulated so much as to over stretch the Parts. Further one of the most frequent causes of Rigidity is the increased density of the cellular membrane. — This too gives more contiguity and therefore more accretion of the various Lamellae of the cellular membrane. —

This gives us the variety of Tension and Laxity in the different parts of Life. What has been here said of cellular texture extends to every vessel of the System. This finishes our consideration of the different states of the simple Solid, and of the causes of these variations.

Gautier assigns another cause, the violent partial destruction: this may take place, perhaps

150

169

169-200.

in the case of tendons and Ligaments, being torn. We cannot perceive that this admits of any application & it is not worth observing. These different States of Tension & Laxity must have great effects in diseases, and as they are capable of being directed to useful purposes by the Physician, their consideration must be of the utmost consequence.

This finishes the Subject of the simple Solid.

Morbi Solidi Vivi. Page 72. Cap. 169.

We now proceed to consider the Solidum vivum; in doing this we must first consider the doctrine as delivered by Galbins; but three do it shortly.

The first gives us an Idea of a Solidum vivum, but his definitions run in a circle. A contractility that is excited by a number of causes not acting on any other part of nature is with him the vis vitalis. But we must add that acting as Elastic it doth not follow the same Laws in this respect with other bodies. Thus in the Extension of other bodies, the Contraction is in proportion to the stretching power: In the Solidum vivum this doth not happen. Instead of saying Occasional

(1) Gualtero had no occasion to observe as he does in his 179 Par. that Sense communicates with the Vis Vitæ; for Sense & Contraction are no more than modifications of the same nervous power in different parts of the System.

and not cause, we would rather call them parts of the cause. He is guilty of great, improperly in supposing two different faculties in the *Solidum Vivum*; for these are no other than the two different states of the Agent & the Patient in every action of Bodies on each other. This view however has given him the foundation of that division which we have before noticed & adopted. But we changed his terms & gave a different explanation of the *Facultas Sentiendi*, confining it only to those cases where the thought is interposed. If we take in all the circumstances of the Impression & the State of Conception, his proposition in Par: 17th might be admitted; but this leads us to confusion. In the whole discussion of *Solidum Vivum* Grubius makes it to reside in the muscular fibre only, & very little different from Fallopi's *Vis Vitalis*, which doctrine we have before exploded. (a)

From Par. 181 to 187 he enquires into the nature of the *Vis Vitalis*, upon which part we have already made sufficient observations. We agree with him that it is a *Principium sui generis*, but refuse that it is repairable
by

169-200

by Aliment: we say that it is a *subtile quod-
dam spiritum, sub ipsa concretione inditum*.
It is indeed different from the matter of Electri-
city &c., but has an analogy to them and is
only a different modification of the same kind
of matter. This power must be liable to its vicia
of excessus & defectus, and these vicia to be se-
parated from the consideration of the simple
solids affections, from organic affections, and
from the affections of the fluids in the ordinary
way in which they are considered by Pathologists.
As to the term that of *sa opposita* is liable to the
same Ambiguity as the term Nature which we
have considered before as inclining too much to
the Gallican doctrine.

In Par. 190. he begins to consider the Na-
ture of these affections of the *Solidum nervum*: he
views them in too limited a manner and with
some confusion of terms. He confines himself
to the consideration of the moving Fibre and
has therefore only *Fortior* and *Irritabilitas*; but
when he comes to define *Irritabilitas* he makes
it almost the same with *Sensibilitas*, & should
therefore either throw away the term *Irritabilitas*
or explain the meaning of the term *Sensi-
bilitas*. —

Sub

(But we must here desert Gaubius & *arsid.* 48.
on the matter in our own view.

In the first place we consider the Nervous System
as a whole where several parts have a commu-
nication in giving & receiving motion. In this com-
munication we can perceive different degrees of
Facility both in different persons & in the same
person at different times. In this Facility we
must conceive one degree in which health consists.
This has undoubtedly some latitude, but beyond
it there may be an excess on either side.

Whenever the facility considered in common to
the whole, or in the proper proportion of the several
parts would keep to the general terms of Mobility
and Inertia. But in some parts we may perceive
intermediate states that distinguish them. It is at
surge the motion beginning in the Organs of
Sense & passing to those of Contraction. There is
a certain proportion in which health consists. The
motion from the Sensorium Communis to the
muscles being in proportion to that from the
Organs of Sense to the Sensorium. But there may
be a different degree in this proportion.

If the Excess or Defect of the Facility of Mo-
tion lies in the motion between the Organs of
Sense and Sensorium, this is an affection of
Sense.

(2) What is here meant will be illustrated by considering by considering the difference between the Mobility & Strength of a Bow.

Force. If it is a motion from the Concomitant (exemplum) to the Muscle, this is an affection of Irritability. So in the Organs of Sense we will except Sensibility, the defect Insensibility: in those of Motion, except Irritability, the defect Torpor. With regards the propriety of admitting this division a question arises about the Proposition Contractio proportionalis: but this we have before discussed, and so need not enlarge upon it here.

We come now to consider the causes of these affections. Sensibility & Insensibility are then caused with the Mobility & Inertia of the whole. So Irritability & Torpor may in many cases be also the same. But other circumstances concur here. Thus the State of the Solid parts to be moved, supposing the mobility given, must have an Effect on Contraction, and Increase or diminish Irritability. From this consideration Sensibility & Irritability must plainly be distinguished from each other. But, further we must distinguish ^(a) Facility from Torpor; and the debility or strength of the Organ of Contraction is to be taken separately from mobility. Debility often concurs with mobility, and so may produce Irritability. As in Contraction there are different circumstances affecting it, so this will produce different effects from a suitable Cause.

(6) The conditions of the Sensorium commune to be affected with Impressions may be considered as Sensibility; to be determined to action or volition as Irritability.

cause applied. These however are too oft confounded with Irritability.

We have hitherto enquired what passes in the Sensorium commune in speaking of the Facility of motion. We observed that what passes in the Sensorium may be arranged under these three heads Sensation & Motion. These are variously combined, and different in different cases. These are to be distinguished in the same manner as Sensibility & Irritability. Thus in the case of Fear or Anger. A man ^{more} affected with Fear is a person of Sensibility he with Anger is a person of Irritability. In Irritability we may observe a difference of Facility & Force. One man being very easily inflamed with Anger, another not very so, but with greater force. Whether any other simple Affection besides these we shall not consider at present.

In considering the Causes of these Affections, we must enter into the Mysteries of the Nervous System. These Causes may be referred to these three Heads.

- I. The State of the Nervous fluid itself.
- II. The proportion subsisting between quantity and Velocity of the Nervous fluid, ^{on the one hand,} and the Tension and Elasticity of its confining Membranes on the other.

III. The

(a) The condition &c of the Nervous fluid therefore will likewise remain. But these causes can affect the condition of the Nervous fluid in a more slow & gradual manner. They are therefore seldom to be considered as in themselves inducing morbid states of the Nervous fluid tho' they may contribute to predispositions. Of the causes much more sensibly & suddenly inducing considerable changes of the Nervous fluid & consequently giving occasion to Diseases are first heat & cold.

I. State of the Nervous Fluid itself.

The Nervous Fluid like other Fluid may differ in density & Elasticity. These sometimes proportional but not always. Thus whilst the Elasticity of it is 1000 times greater than common Air, its density is much less. In common Air whilst its density is diminished by heat, its Elasticity is increased. In the Nervous fluid we may suppose the density & Elasticity in different States. The former may give mobility. The density diminish it.

By the Analogy of other Elastic Fluids we may suppose the Density to be varied by the different States of the Matter in which it inheres, either the simple solid or more properly the medullary Fibre. This may be considered as the proper State of the Animal body, and as the State of the simple solid will be correspondent to this, the Density of the Nervous fluid will depend on its condition. We observed that the simple solid is varied in the progress of life, but this through the whole is determined by the original Stamina in some measure. (a)

The same may be said of the Nervous Fluid.

Animal life depends on the Heat & Cold applied to it. It is equally probable too that it depends on the mobility of the Nervous fluid. It is therefore probable that the different degrees of heat will vary this & give a different state of Density & Elasticity. But there is in most Animals a power in them to resist to general Heat, so that they do not depend entirely on the surrounding Air. This balance with the surrounding Air differs in different Animals, which makes it difficult to apply this doctrine to particular Animals. But this balance being given, it is plain that Heat will give mobility, cold on the contrary Inertia. Besides, Heat & Cold affecting the Elasticity of the Nervous power, it is difficult to say what other external powers may do the same. We have formerly said that Sedatives & Narcotics probably act on the Nervous fluid itself, independant of the solid matter. It is a Maxim in Philosophy that matter only acts on matter by contact. In the case of Sedatives there is a matter acting on a small portion of our Nervous fluids, when even its effects appear at a considerable distance. This must either be by a propagated Impulse, or we must suppose the matter to be insinuated and diffused in our Nervous fluid, and thereby capable

capable of acting to a considerable distance. As to the first we may say that from Impulse nothing but Impulse can arise. But as here is a diminution instead of an Increase of Motion we are obliged to have recourse to the second Supposition. This is the foundation of the Hypothesis of Narcotics acting by being combined to our Nervous fluid.

But we must own that this is not a conclusive Argument, but like other Dilemmas may be a Sophism. All Impressions on our System are made by Impulse, and as this must act by increasing motion, every Impression must be Stimulant. But we find that in the Nervous System a particular Modification gives sometimes a Stimulant, sometimes a sedative effect. It is clear that it is not necessary in our System, that a motion, which should go on in producing Motions continually. But perhaps this may depend on perception alone, and be a Law of the Nervous System alone, not of the action of matter upon matter. Yet we find that in those excised parts taken out of the body, Narcotics still preserve their proper effects, and this must be looked upon as the action of matter upon matter.

It is probable that as Narcotics thus diminish the mobility of the Nervous fluid, so other Bodies may increase its mobility. This may lead us to

an Explanation of the Actions of other Poisons, whose Nature we are not yet sufficiently acquainted with.

II. The proportion subsisting between the Density and Elasticity of the Nervous fluid on one hand, and the Tension and Rigidity of its surrounding Membranes on the other.

We now proceed to consider the 2^d head of issues. To Oscillation of Elastic fluids it is necessary that these be more or less confined by pressure, or otherwise, as the Nervous fluid is by surrounding Membranes. We observed before that the Density or Elasticity of the Nervous fluid, are in proportion to the State of the Matter to which it adheres. Two different proportions may give different Temperaments, yet they are not likely to prove occasional Causes of diseases. Notwithstanding this, it is probable that this proportion is varied considerably in the progress of life. The Medullary Fibres seem to suffer little change, whereas the cellular Structure and Membranes formed of it seem to undergo very considerable changes. The proportion therefore must change considerably.

In the first part of Life the proportion is on the part of the Nervous fluid. Afterwards the surrounding Membranes become more tense
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and rigid, and are an over balance to the nervous fluid. This is a general Idea, but to point out the Ideas of it is very difficult.

We are of opinion that at first the fluid is of little Density & Elasticity, but that the nervous fluid acquires this early in life. This may be at the time when Sensations and Memory begin. This is from 5 to 7 years of age. But the medullary fibre having thus acquired its proper state, is very little changed afterwards, whereas the surrounding membranes are greatly. We may suppose a time when both the nervous fluid and the membranes are at their highest degree of perfection, and in the justest proportion. This is the apex of life, after which Susceptibility, Irritability & Strength diminish in consequence of the increased Rigidity of the surrounding membranes.

I shall only now attempt this general sketch of the matter. I will explain predisposing causes on several occasions.

But besides there are Occasional causes affecting this proportion between the fluid & surrounding solids. The Elasticity of the fluid in proportion to its density is greatly varied by heat and cold, and this may change the proportion between the nervous fluid and the surrounding solid, the

Simpler Solids. But Heat & Cold act the former more readily on the fluid, the latter on the simpler solid. If continued will probably act on both. The action of heat & cold on the sanguiferous system is an illustration of this; where it may act on the fluids & solids. Heat acts more quickly in rarefying the fluid than the solid, and therefore the effects of it as first applied are Expansion and Distension.

Cold acts more readily on the solids, to cause them more exposed to it and because they are sensible. The same will apply to the Nervous system, and produce Sensibility and Irritability.

We come now to mention those powers that affect the simpler solids. But there are various and other causes here of Cold & Heat. But the fusion of the bands will have great effects, as before observed, and may variously modify Sensibility and Irritability. An instance in Ben Swinton at the time of the most remarkable degree of Irritability in a young lady by Dr. Astruc 1742. The wound the body & limbs to give a higher degree of tension.

As a want of tension gives mobility so an

an excess of tension, for the more the tension of the whole system is, the more will it be affected by any slight variations in any part.

III. The causes affecting the Action of the Sensorium commune.

We are now come to the third general head of causes such as affect the Action of the Sensorium commune itself. Under this title we comprehend all effects of different States of the Sensorium that can influence the Mobility of the Nervous power. 1. The Communication between Impression & Contraction is only through the Sensorium, and therefore Contraction following Impression will be more or less easy as that Communication is more or less free. The Communication may be affected by pressure, not only situated on any Nerve, but by pressure on the Organ itself. This is observed in a great variety of morbid cases as stupor &c. arising from fluids variously accumulated in the vessels of the Brain or effused there. This leads to an observation or two not strictly connected with our subject.

I. It is difficult to determine to what degree this pressure proceeds. The occasion of this difficulty is that there occurs a state of the system, remaining

so for a long time in spite of all medicines
used to renew the communication, and yet such
cases have been afterwards accidentally cured
as by a fit of Anger. But the communication is
not only not completely shut up, but a Nervous
Influence is propagated to the Extremities of
Nerves: for application of Stimuli, as of Electricity,
will excite Sens and motion in these parts.
This may lead to a supposition that the Nervous
power remains long inherent in the Extremities
of Nerves, after the communication thro' the Sen-
sorium commune is shut up. Such a supposition
would greatly affect the question, that the Ner-
vous power doth not depend on Association.

II. Another observation is, that oft in Paralysis
Sens remains when motion is lost. This leads
to a conclusion that Life Force power, tho' com-
munication thro' the sensorium commune is
necessary to sense, is not motion.

After this digression we return to our subject, and
observe that Mobility may depend on the com-
munication in the Sensorium commune being
affected by pressure. Hitherto the Subject has
only been considered in the case of diseases we
shall now consider whether in the Latitude of
health there may not be such a degree of pressure
as

as to affect the mobility of the Nervous Sys:
tem.

By what Circumstances can we discern this
propensity to take place? Anatomists have not
observed in different persons a different propor:
tion of Cortical to Medullary parts of the Brain,
tho it is very probable there is a difference. There
is a foundation for some such supposition from
the Observation made upon large heads. The
case of Infants affords another instance of this
larger proportion of head to the rest of the body,
and in them we know that there is a greater
quantity of fluid sent to the Brain in proportion
to its size. This may account for their Torpor
and Stupidity. This excess of proportion in the
Cortical part of their Brain may prevent the too
great degree of Sensibility & Irritability that might
arise from their Medullary fibres soon arriving
at perfection.

Further, we find at different times of life, and
in different Temperaments a difference of Propor:
tion between the Arterial & Venous blood. The he:
mious blood in the head is not subject to mus:
cular pressure, and its return from the Brain
is conducted in a particular manner, so as to
retard its progress.

The

We are led to think this is intended to serve particular purposes in the Economy. Since the Venous Blood in the brain is liable to be accumulated, and thus in base with a larger proportion of it in the Brain, it will affect the mobility of the System and give a particular temperament.

This Retardation increases in the progress of life, for then the Venous Blood is always in an over proportion to the Arterial. Hence the Senile and other old age, and a man at that time of life is most exposed to soporose diseases.

Hence then the state of the sanguiferous system in the Brain may variously affect mobility and Inertia. But in the medullary substance itself, there is something affecting this mobility. It is probable that in different conditions the Nervous power is sometimes more accumulated in the brain, sometimes more freely distributed to the whole System. The first gives Inertia, the latter mobility. This is easily taken up we consider that Inertia and mobility are only other words for sleep and waking. We must repeat nevertheless, from the Elasticity of the confining solids, the Nervous power is resisted and pressed more to the Sensorium commune during waking and if it were not for certain powers, would stagnate in

in the Sensorium commune.

What are these powers? Two of them are sufficiently obvious. 1st The impulse of Arterial Blood at the basis of the Brain. 2^d The Action of various external Impressions. The first is more constant & evident. We see that if the heart ceases to act, the functions of the Sensorium commonly cease. We may observe hence that this is greatly prevented by a reclining posture. These effects are so sudden as not to be accounted for from the ceasing of a secretion. Again, when the Impulse is a little more violent, it proves a Stimulus to the Sensorium. It is then is probably what keeps us a determination from the Sensorium commune to the Organs of Sense & Motion, keeping the Nerves full & preserving Solids in proper order. This we call the Tonic power. The determined degree of it is regulated by Salut, and a diminution of that determines degree gives Irritability, as the excess doth that other kind of Irritability mentioned before.

It is difficult to apply this general doctrine to particulars. The reason of this is, that we do not exactly know the state of the Heart's Action, or whether a less frequent and fuller action is more powerful than a more frequent one. Now to
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consider how far the distribution of the Nervous fluid depends on the Impulse of the Arterial Blood alone, or whether in every diminished impulse in the Arterial, the venous, Blood in proportion stagnates, is accumulated, and concurs in compressing the Brain, & thereby diminishing the distribution of the Nervous power to the whole System. Though we cannot exactly determine the different States of the heart's action, yet it is necessary to enquire by what causes the Heart's action is increased. There are two, 1. Influence of the Nervous (Cerebr.) 2.^d of the Venous Blood. The heart has its Nervous power in consequence of the common Tonic power. Tho' more steadily determined to it than other parts, yet every variation of the Tonic power will probably affect this determination of the Nervous power to the Heart, and thereby variously modify its action. Here then we see a connection of cause & effects, the Sensorium acting on the heart, and this again on the Sensorium.

The Action of the Heart may be further affected by other causes independant of the Sensorium. For the Tonic power being given it is highly probable

table the action of the heart is varied by the state of the blood.

The 2.^d general cause of the distribution of the nervous power to the system, is the variety of external Impressions. Thus we see that when the distribution is at a stand, and the action of the heart itself stops, but various other Impressions restore the Tonic power, and in consequence of that the action of the heart. These Impressions keep up the Tonic power, and in consequence of that the action of the heart. These Impressions keep up the Tonic power in the state of waking.

To reduce this doctrine of Impressions to general propositions.

As this distribution depends on Impulse, the Tonic power will be in proportion to the Impulse. If the Impulse is excessive the Distribution may also be faulty in excess. But a moderate use of all the Functions tends to strengthen them.

2. The effects of Impressions are most considerable, *ceteris paribus*, as these Impressions are more varied. Thus impressions by engaging the attention can destroy the Sensibility in every other part of the system. To render the distribution more general it is necessary that the Impressions

Impressions be considerably varied.

3. If there are causes of Impression acting otherwise than by Impulse, as by affecting the condition of the Nervous fluid itself giving it rarity & thence mobility, these will be new sources of Effects of Impression.

4. The Effects of Impressions will be in proportion as they are attended with reflex sensations. For this is modified as the Impression is attended with Agreeableness and Disagreeableness is difficult to say. The Effects will be greatly varied according to the different degrees before given of each. On the side of the Disagreeable we can see there are distinct Genera; The simply Disagreeable the Uneasy, and the Painful. If the simply Disagreeable, those referred to them are what we call the Measures of the Imagination. These give an increase of Sensibility with regard to the object, and moderate agreeable Impressions prove a Stimulus to the System. But as they are moderate they seem never to give Irritability. The Unpleasant referred to the Uneasy we spoke of very fully before, and showed it to depend on the fullness and steadiness of the Sensitive power. These give a Sensibility to objects of the same cast. The Unpleasant Impressions give a Sensibility, but to objects also of the same

same nature, and in consequence of that has a particular Irritability to the same. The pleasant sensations opposed to the pain, by occupying the Attention destroy Sensibility. But when the Impression is gone, it leaves the body relaxed, sensitive, and irritable in proportion to its degree. — Bodily pain hath determinate effects according to its degree both when present and past. When present it gives both Sensibility & Irritability but this is limited according as it engages the Attention. But as pain has power of determining to the System in general and to particular parts it increases Sensibility & Irritability. When it produces Syncope and even Death is not known, but it may be supposed to produce its effects by determining the Nervous power to one part and leaving all the rest destitute. Hence when past it produces, Stomia and Torpor.

This is a general view of Pleasure & Pain giving Sensibility or Irritability according to their Degrees. We might go on to show how these are modified or attended with Impressions, Aphelides, & Passions of the mind. But we are too ignorant of the Action of the Sensorium to discuss this subject properly. We see that a particular state of the Body follows particular states of the mind.

This Subject will be resumed in another part of our Pathology.

We go on to observe that Stimulus acts by causing a Determination of the Nervous power to the part to which it is applied. The Sensation of particular parts may depend on Habitual Stimuli, and so the want of these may leave the part more insensible, and irritable. In the Blood vessels a Stimulus applied excites the Action of the vessels to a certain length; this must be attended with increased Impulse, which will increase the Sensation & hence the part acquires Sensibility; hence Inflammation may give Sensibility to parts not before possessed of it.

Further, by Repetition Sensibility is diminished, Irritability increased. Habit determines the order in which Actions succeed each other, and also the force and velocity with which they succeed each other. Hence a particular Equilibrium will be constituted between the parts of the Nervous System. A change of this order then disturbing the Equilibrium, will give effects of Irritability. Hence we see why every new & strong Impression is so irritant to our System.

It might be of service to give another Head of Sydenham's Axioms; but this we cannot prosecute at present.

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This finishes our consideration of the effects of the Sensorium commune; we shall not, like Gaubius, consider here the general effects of these Affections; but proceed to consider with him the Morbi Solidorum Continentium.

Morbi Solidorum Continentium. (Page 200.)

Physiologists after considering the Affections of the Simple Solids, proceed to consider them as, related to particular functions, or the Morbi Instrumentales. Yet in doing this they consider the Solids only as so many Masses without any respect to the Functions they are intended to, serve. The Division of the Morbi Similes and Inimici amongst the Affects was also improper; so under the first they only considered the matter at which our Affects resist. But as here handled this part doth not properly come in here, as not tending to throw any light on the Proximate Cause, which is the chief purpose of this part of the

1077.

Accordingly Dr. Gaubius himself observes that these Vicia do often times not at all disturb the function, and that they are rather to be considered as effects or symptoms, which is really the case.

He

We shall therefore pass over this whole Treatise of *Medicæ Librarium Instrumentales*, as they are rather to be referred to Anatomy, and would lead us far from our purpose. A part of them will here in more propriety be considered, under our *Symptomatology*. —

Morbi Solidorum continentium
sunt vel.

I. Non continentium

1. Intra medium

- A. Per vim distendentem ductam.
 - a. Congestâ liberare mole.
 - b. Volumine expansione aucta.
 - γ. Impedito Trajectu.
 - δ. Impetu Acceleraum enormi.
- B. Ob vim continentem immixtam.
 - a. Aërealis Membranis.
 - b. Ruptis quibusdam ex pleuritis.
 - γ. Suffimento Alia's.

2. nequaquam continentium sed Imittentium.

- A. Per Anastomosis.
 - a. ob causas 1. A. B.
 - b. ob Sphincteres resolutos.
- B. Per Diuresin factam.
 - a. in Mechanicâ æternâ.
 - b. Ruptione a distendentibus quo Inzis!
 - γ. Infectione quâ Si a 3 0 0 6 15

II. Non Transmittentium qui Obstructio.

1. Absoluta.

A. Per Obliterationem.

a. Per materiem indigenam in vase non sua impulsam, qui Miror Loci.

b. Per materiem indigenam degeneram.

c. Per materiem alienam.

d. Per partem intus acceptam.

B. Per Angustationem.

a. Ob Exsiccationem Parietum uictam.

b. Ob compressionem uicernam.

c. Ob collapsum.

d. Ob contractionem.

e. Ob Tonicum.

2. Relativa, cum plus infundatur, quam quod eodem Tempore transmitti potest

In the Series of Proximate Causes the State of the Conformation of the Internal parts has great Influence, and therefore may properly enough be considered here. (Vide Table above.)

Gaubius has done this in his chapter of morbi Solidorum Continendum. He observes that these Cavities have their particular sizes, which if they exceed or be short of Diseases may arise. This division is not correct, thus for instance in D

This cannot be considered as a difference of C. since

Of the increased size of Cavities he makes 1 species. He ought to have divided the morbi Solidorum Continendum into two kinds.

I. Those which contain their fluids imperfectly, which gives the dilatation of Gaubius, and

II. where they do not contain the fluids at all, under which his 3 other species are to be ranked.

Dilatation is of two kinds, 1st where there is a greater impulse on the sides of these Cavities. 2^d where the sides themselves are weakened, the Impulse being the same. There are 1 causes which may give rise to the first of these Species of Dilatation, as we find them in Gaubius. To the 2^d head belongs two species, 1st where the sides are weak in themselves. 2^d where they want certain Sutura, which they are ordinarily

provided with.

Of that head of Diseases, where the vessels do not contain the fluid at all, the first is Anastomosis. This may have causes of two kinds, 1.st those that are causes of Dilatation. 2.^d Where the Orifices are provided with Sphincters, & a Resolution or Salay of these Sphincters takes place.

Next follows the Diapedesis; but it is doubtful whether this has any place in our System. It proceeds upon the supposition that a great part of our System is composed of regular Fibres interwoven with each other; whereas we before shewed that it was highly probable that the chief part if not the whole of our solids is composed of cellular texture. The only doubt that arises is with respect to certain muscular Fibres. There are instances of the Heart's being found very thin, but this perhaps is owing to another cause. But the whole of this consideration admits of no application, so Diapedesis may be omitted altogether.

The Diuresis which next follows is of three kinds, 1.st when it arises from external mechanical force giving a solution of continuity. 2.^d From a preternatural Impulse of the fluids. 3.^d From Division. These several cases of the magnitudo Aulæ of Gaubius. In par. 207. Gaubius considers the effects of these affections, but these too to be referred

referred to the Symptomatology.

Next follows his *Morbis Augustia*. Here we particularly find the bad effects of his not considering these affections with respect to their Functions. For *Impeditus Trajectus*, we would use the term *Obstruction*; this is properly divided by Boerhaave into two kinds; 1st where the fluid becomes unfit to be transmitted. 2^d where the Cavities are unfit to transmit the fluids; the last of these properly belongs to us, and is called the *Obturalia*. This is of 4 kinds. 1. The famous *Error Loci*. It is much disputed whether this takes place in the Animal System. Reasons against it are, first, that discovered by microscopes, that if a particle of fluid enters into a conveying vessel, it is imbracted there for some time, but soon the Elasticity of the vessel exerting itself repels this particle. Secondly, Air vessels in their ordinary size may be unfit to transmit particular fluids; but they are of that Elasticity as easily to admit of Dilatation, which will prevent this *Error Loci* becoming a cause of Obstruction.

The 2^d Species is where the fluids become changed in their nature, being now just Lemnations. The Subdivision of this is to be considered hereafter.

The 3^d Species is from a *Materia aliena*, either generated in the Body or introduced from without.

Gaubius adds properly a 4th the Intus Susceptio, of which the chief instance is in the Alimentary Canal.

The 2^d Head of Obstruction is where the Canals become unfit to transmit the Fluids. Gaubius reduces these to 5 heads. 1. Obliteration; this is that straightening of the Canal arising from the sides of the Canal being changed. Next follows Compression, which may be of various kinds; Tumours in the neighbouring parts; Hard pieces of Bone thrown out of their place &c. &c. The next cause of diminished capacity of the vessels is the Collapse when a hollow cavity has its sides falling on each other, which always supposes a degree of Spasmodicity in the parts.

In what parts of the System can this occur? (Probably never in the Arterial System, for tho' these vessels contract it is regularly in their whole dimensions. Neither can it happen probably in the Alimentary Canal. In the Venous System too it scarcely occurs in the smaller veins, in the larger veins it doth in some measure. When will it have effect in producing proper Obstruction? If itself it scarcely can, because, 1st it will yield again to the impulse of fluids poured in. Two other circumstances are requisite, that the Fluids do not follow in, or that external,

external compression prevents it from yielding to this impulse, or that the two sides grow together. Contraction is more considerable where defects by their natural contractile power are brought to a smaller size, so that they do not transmit the fluids at all, or in too small quantity. Gaubius divides the cause of this into three, but how the two first differ we do not perceive.

It is matter of question in what cases the *vis elastica* or the *vis vitalis* takes place. We can imagine that the Elastic power in our fibres may be increased in a particular part of the system by whatever increases the cohesion of the parts, with their mobility on each other. It happens indeed in the whole system in the course of life, but not in any particular part. Contraction then must rather be referred to the *vis vitalis*. We don't know what Gaubius means by saying that the *vis elastica* may prove a stimulus to the *vis vitalis* and thereby induce contraction. Perhaps he had an eye here to the causes of Inflammation.

The last cause is the *localitus*, where the cavity is filled up with some matter produced from the growth of its own sides. ^{There are} two parts of the body naturally disjoined, which, if brought into contact and kept so for a time, do not grow together.

16.
together. Whether it is a portion of coagulable
lymph, or other such matter in the Lymph, dis-
posed to form itself into a cellular Texture, or
cellular Texture is sent off from the Sides. But
in either cases this localus cannot be a primary
affection, but must depend either upon external
compression or on contraction continued for a
long time. Hence this is excluded by several
Physiologists.

(vide) Table for Morbi Solidorum Instrumentarii,

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I. Solutio vitiosa.

A. Absoluta Continui solutio.

a. Fractura.

b. Pulvis.

γ. Continui solutio sicca.

B. Relativa Nexus Incongruus.

a. Nexus lapsu peccans.

b. Defectu peccans.

II. Locatio perversa.

A. Luxatio.

a. Dea-luxatio.

b. Subluxatio.

γ. Symptomis solutio que nexu politico tribuenda videtur.

B. Sternitio, quo vario distinguitur.

a. Pro ratione dexte.

b. partium dispositionem.

C. Procidencia.

D. Aberratio.

III. Vitiis vitiositas.

A. Numeris lapsu peccans.

B. Defectu peccans.

IV. Confirmatio vitiosa.

V. Magnitudo.

A. Lapsu peccans, quo Inarmilas.

B. Defectu peccans.

Morbi Fluidorum. Par. 265.

Casting over the Morbi Solidorum Instrumentarium, for the reasons above mentioned, we now proceed to the Morbi Fluidorum.

The Bulk of the Human Body consists in a great measure of Fluids, and the condition of these not less necessary to the several functions than those of the Solids.

In 267. Par. Gaubius meets with a difficulty in treating these as diseases. This we have nothing to do with as we consider them with a view to Proximate Causes. The Fluids may either be considered absolutely in themselves, or with a view to the Solids. This gives the Critica Absoluta or Relativa. Fluids differ from Solids, but only in the degrees of Cohesion between the parts. But in the Fluids themselves there are various degrees of Cohesion which deserve our notice. Gaubius therefore begins with considering different degrees of fluidity. He considers all deviations as affecting the whole Fluids, or only particular ones. This occasions some confusion. The consideration of these deviations in general will be little understood, till we apply it to the case of particular Fluids. We shall however follow his order in this respect. Instead of the Morbi Coherentie, & Acritates

The conclusion then of Dr. Gaubius must be rejected.

We may admit that the greatest part of our fluids is water, and that the fluidity is, *caloris praevalens*, in proportion to the quantity of water. But a different fluidity also arises from the mixture of the solid, according to the diversity of the conditions. This however contradicts the proposition Gaubius set out with concerning fluidity. A small quantity of acceps will give viscosity to a large quantity of water. Some of the *crinacea* do this in a less degree. This shows that the different conditions of the solid influence fluidity.

Gaubius goes further, in supposing these ingredients to be earthy, phlogistic &c. But there is no reason to believe that these have any inviolating quality. Gaubius hints also at a *mucosum quiddam* as existing in our fluids. We have already observed that we have no evidence of any such matter being present. The proper proportion of these, with the conditions of motion and heat give the proper fluidity. Motion assists also in diffusion. That is a principal instrument or means of fluidity in our fluids. But heat only relates to bodies in solution. With regard to mixts it may seem to increase their solution, but this probably is owing only to its effects on solution. But as the heat of the human body is very determinate and doth not admit of much

laxitude, it cannot occasion any great difference in the Fluidity of our Fluids. At least it doth not act much on the Aggregation of our Fluids.

A Question next follows whether Fluidity is owing to any particular Form of the particles of our Fluids. Boerhaave supposed that the Action of our vessels gave a degree of Solidity, wearing off the Angles, and giving a smoother Spherical form which is the foundation of fluidity. We do not know the particular form of the smallest particles of our matter, nor the Causes which can influence or change these forms.

Gaulerus next goes on to divide *Spissitudo* & *Scorbutus*. *Spissitudo* is of two species. 1st Depend on the defect of fluid parts. 2^d On the excess of solid parts. The defect of fluid parts may be either owing to the want of a proper supply, or to their after separation again. We would observe here that a morbid *Spissitudo* induced by any of these causes is very rare.

If the fluid part of our Aliment is in an inferior proportion, it may either have the effect of diminishing our ventral excretions, or by that of preventing the separation of the saline particles of our Fluids.

The *Auctiores lymphaticae Excretiones* too by producing Thirst, prevent the bad consequences that would otherwise arise. But this seldom happens in the whole System, and if only partial the Excretion is diminished in other parts. In Dropsies too there

There is a sensible diminution of Secretions, which compensates for the want of the proper Proportion of fluid parts that might otherwise occur.

Further it is very difficult to find when such a morbid Spissitudo doth take place. The consequences of Dropsy do not seem at all deducible from this Spissitudo.

As to the 2^d Species of Spissitudo, it is very manifest that there will be a great difference in this respect in different persons, according to their diet, Temperament, way of life, &c.

We have before refused the existence of the Gluten Serum, so I now no occasion to follow his reasoning on that head. We is willing here to support the *Pilula fructus* of the Patients.

What next follows is still more subtle, but with regard to the doctrine of Elementary parts we have spoken fully before. All these matters mentioned here must be so much changed by the solution and fermentation they necessarily undergo in the Alimentary Canal, as not to be able to occasion any change in the Consistence of our Fluids.

The general Effects of Spissitudo here given are chiefly Obstruction.

Excess of Fluidity is divided into two general Heads. The first of these, when the textural parts are in over proportion. The Causes here adduced are generally just. Some doubt whether the warmth or coldness of the Liquids taken in can have any effect

effect. It cannot have any beyond the Stomach, but there cold drink acts as a Stimulus, and maintains the System in a more healthy state, whilst warm drink relaxes the Stomach, and in consequence of that the whole System.

A curious question arises here; How far Bathing increases fluidity? When the Perspiration is languid the Body becomes a kind of Sponge, and assumes a great quantity of Humidity. In the other cases it will scarcely have any great effects in this way. This ^{was} afterwards acknowledged by the Doctor to be sometimes a Cause of Torpidity of our Fluids.

How the Incuriations Nimis should act this way is difficult to conceive. It would seem that there is some inaccuracy here, and that effects are here confounded with causes.

In the 2^d Species depending on particular Ingredients we do see that a large proportion of Saline matter in the Serosity will make it dissolve a greater quantity of Coagulable Lymph, and thereby give more fluidity. The Cause of this will come in more properly elsewhere, and we shall not stop to take notice at present of these effects.

The Acidales Humors in Morbosa we choose rather to consider in the States of the Mixture of our fluids.

We would observe that Plandities is a general quality of our fluids. The common mass has always an Acid matter to the Taste. Several of the Secretions are naturally very acid. Many of these Secretions are afterwards too absorbed into the common mass. But it is enough for us that our System is insensible to certain Acrimony. Accordingly we suppose that this happens in the inner surface of the blood vessels, which are not sensible to certain Acrimonies. The secretion of Urine is apt to stay after its secretion, and this Acid matter it circulates for a considerable time in the common mass without showing any mark of Stimulus.

What follows on the subject of acrimony we have already taken notice of, and given our Opinions concerning it. I rubius next divides Acrimony into mechanical & chemical. Before entering on this he considers by what powers our System is defended from this Acrimony. These he refers to 4 heads. 1. The Plandity of the Aliment taken in. 2. But some Acrimony is taken in this way. The 3^d power is that Nature has provided the prime vis with a certain Sensibility that operates by throwing out the offending matter. As to the contraction of the Absorbents, this is merely a supposition not proved by facts. Many Acrimonies undoubtedly

enter the prime. Vies, & thence the Lacteals, and appear in different parts of the System. Another Supposition may be conceived, that these Absorbents have an Eccentric Attraction to certain particular matters. But perhaps whichever of these Suppositions we adopt it may be probable that certain matters may escape this Infiltration or Eccentric Attraction, by being intimately diffused and blended with the Chyle. If Acrimony gets into the common Mass of Blood notwithstanding these powers already mentioned, Nature has also provided other powers to guard against the Acrimony. It is probable too that the Animal A.C. is absorbed on these occasions to serve the same purpose. The Acrimony introduced can only be in small quantity, but still as it enters the Lacteals, where it is diffused with the whole Chyle, & afterwards with the common Mass of Blood. —

But further Nature has provided several Secretories to take off that portion of our Fluids which is likely to associate itself with foreign matters. Hence we should be very cautious of admitting Acrimony in our System.

The Boerhaavians have supposed also a mechanical means of preventing Acrimony by the changing the angular form of the particles into a

a Spherical one.

The Sources of Acrimony are two. 1.st A foreign matter introduced into the System. 2.^d An Acrimony produced in our fluids. The chief Causes of this according to Gaubius are excessive Motion of the Fluid joined with the natural process of Fermentation. Another cause is directly opposite, viz, the Stagnation of the Fluids, whereby something is kept in the Syst which should be thrown out. Further a defect of any of the Functions intended to correct or remove Acrimony will necessarily be a cause of it. The chief effects of such Acrimony are Dolores Pruritus, Convulsions, &c. vide pag. 306.

Still however those may rise from other causes and are not always to be referred to Acrimony alone. But further, Gaubius goes on to observe, that particular fluids are liable to particular degeneracies. The Urine is with Acidity. This chiefly prevails in the Urine, and it may be doubted whether it ever exists in any other parts of the System. No Observations show that a Fossil Acid has ever been introduced into the System, so as to prove a Cause of disease. We have therefore only to consider the vegetable Acid. The defect of some of the Stimulating powers must be the cause of this appearing in its proper form in the Urine, and becoming a morbid

Acidity. Thus the fluids may not be supplied in proper quantity as much as required, or not rightly blended with the Aliment taken in. Or the Stomach perhaps may not evacuate itself suddenly enough. All these may arise from a debility of the Stomach.

In pointing out the effects of Acidity Gaubius enters into a Chemical Reasoning, founded on very doubtful principles. Every view we take of our fluids leads us to believe that every addition of fluids to this Acrimony tends to prevent it, and that there are particular fluids particularly opposed to it. All this leads to the supposition that Acidity never appears in its proper form beyond *in prima via*. Our fluids probably consist of different ingredients according to the Nature of the Aliment and the state of the Assimilating powers, and this difference may give a particular character to our fluids. But still we ought to be very cautious in assuming what is the particular state of our fluids, and deducing the causes of diseases from thence.

Gaubius adds that an Acute Acrimony may also be generated. It may be so, but how it is generated, or how it may produce the effects ascribed to it, is a very dubious piece of Theory. The Acrimony of the ^{volatile} kind might appear probable but ever was shewn dubious about it. None of the causes assigned for it.

it can likely to produce it.

Whether in the solid state in our system is analogous to the same in vegetables, is only inclining to the same way of putrefaction, and the state of putrefaction. We marked out the more distinguished steps of the fermentative process, but there are some intermediate ones which we have not noted. What may be the state of the fluids in these intermediate states, and what effects it may have in producing disorders, we are little acquainted with.

A properly putrid matter is capable of promoting our natural fermentative process in our system & of stimulating greatly in a short time. Whence the various Acrimonies consist & what state they induce we don't know, and confine ourselves to general terms. We cannot therefore follow Gualtieri in his reasoning on this subject, where he endeavours at an explanation.

For the Muculent state takes place it very seldom happens that a proper Muculi is detected in our system, even when every circumstance has occurred that would form its evolution. It has been supposed that the application of Rhenish salts will decompose the Sal Ammoniac within us, & drive it out. But it is very doubtful whether this ever takes place in reality.

Dr. Fuscham has supposed that the use of Rhenish salts

Alcalescents may induce an Alcalescent state in our fluids. But if we consider the quantity of fluids taken in at that time their being introduced in such small quantity &c. we cannot conceive that they ever decompose a Sal Ammoniac. They more probably act by diminishing the quantity of Acid that might be found in our fluids. Neither do we know that any poisons are of such a nature as to give occasion to the Evolution of O_2 . i.e. a volatile alkali.

With regard to the Putrid Diathesis, a putrescency, both take place, but whether the putrid state consists with regard to the Saline & Oily parts, is not known. We can allow the more general denomination of it, but in what circumstances it is owing to one or another cause we are much at a loss to determine. However directly opposite causes should produce the same effects is hard to explain, but founded on fact. There is a certain Evolution of some Effluvia, which if carried away to the surrounding air no Putrefaction ensues; But if this stagnates on the surface so as to be allowed to be reabsorbed this will give occasion to Putrefaction. This appears in the perspirable matter on the surface of the body, and still more in that from the Lungs. Whether this Metabolic Air acts as a Poison is not certain from Experiments, but it appears very probable.

In giving the general heads of Putrid Acrimony we want a distinction of the several species of putrids. Gaubius then goes on to consider the Murialic Acrimony. No chemist has yet explained what is the effect of the common salt we take in with the greatest part of our Aliment; or what is the cause that this matter is so hurtfull to certain Animals, so beneficial to others. It is therefore difficult to say what are its effects in us.

The Sea Scurvy is by many supposed to be in part owing to the common salt, and contrary effects have been imputed to it. we may admit in general that all Saline matters give a Tonus to the fluids, render them more Acid, and may in several parts of the system prove Stimuli. But whether they induce Putrefaction, and give rise to the several Phenomena of Scurvy, we can by no means determine. we are of opinion that this Murialic Acrimony occurs very rarely.

The Ammoniac Acrimony we may more readily suppose, this being a natural consequence of the putrefactive process. This will account for several of the Phenomena of Scurvy tho' not perhaps for all. yet the Serum of Scorbatic blood has proved Antiseptic to other putrid matters.

Besides

Besides these harmonies which are the chief. 91.
there remains others not yet noticed.

Gautier next proceeds to another consideration
which is properly introduced first by him in Pa-
thology. We see that the particular matters of
which our fluids consist may separate from each
other. But there are two kinds of secession which
Gautier confounds together, the secession of matters be-
fore joined by diffusion, and those joined by solution. —
with regard to the first he supposes it of two kinds.
1. The secession of watery parts from a too ^{quantity of} ~~small~~ ^{large} ~~quantity~~
mentum, &c.

2. From

It is probable that both these take place, tho' hard
to say when the one and when the other prevails. In
general there is a secession of the Red Globules &
Lymph from the serum, but sometimes also there
is a separation of the Red Globules from the lymph.
We know that this takes place too within the system.
We therefore suppose that there is a particular
condition of the fluids disposing to this or that
secession, but don't know what these conditions
are. This will be resumed in another place.

With regard to the secession of coagulable Lymph,
Gautier supposes it to be of different species; but
we

we do not know what foundation there is for doing so. It is in that species which has impulses to earthy matters, that he chiefly confounds the description of matters before joined by infusion, and of those by solution.

Our Fluids are to be considered in three different states, as Chyle, Blood, and various Secretions. This is the view having in view of them.

Chyli Vitia. Lib. 323.

Nature has used various means for Assimilation, so it is difficult to conclude from what appears in the *Prima via* to what actually prevails in the system.

There is no proof of the Acid Acrimony prevailing in the Chyle. We are inclined to doubt of several the causes assigned of it. The Effects of Acidity in the *Prima via* are very justly marked out, but not certain that it extends any further.

Next follows the Alcalescent Acrimony. Putrid Ingesta may have this effect in the *Prima via*, but more commonly it appears in the Stomach in consequence of the mass of Fluids being first affected, and these putrescent humours being poured back on the Stomach.

(F)

If these external causes the Bile seems chiefly
to be in fault.

The next kind of Acrimony mentioned is Acan-
cescence. This is not so liable to happen as Gaubius
thinks, nor can all his causes be admitted here.
There are such provisions in the prima via either
to assimilate these matters, or to prevent their being
admitted by the Lacteals.

The same may be said of the viscidities which next
follow. Some of the effects ascribed to this are
very improper, as the vomiting of Bile (Phlegm, which
is nothing more than the Mucus lining the Stomach,
is to the other effects too they must be rare, as the
causes are rare.

Neither Gaubius has considered the effects of,
the Chyle according to its mixture; he now proceeds
to consider the different proportions of its Ingredients
which probably do not take place and influence
the Fluids of the system. But it is very difficult here
to concede upon particulars, or to point out
either the causes or effects of these different pro-
portions.

With regard to the Bile, we before endeavoured to
show, that it is rather dissolved than diffused in the
Chyle, which would prevent any such Reception as
Gaubius assigns for the Cause of Obesity.

anguinis

Sanguinis Affectiones. Par. 331.

We now proceed to the Sanguinis Affectiones. The first part of this section we have already touched upon, it being purely Physiological. It is probable that a certain proportion of the several parts of the Blood is requisite to health, but this will admit of a certain Latitude. We know the excess of Serum will give fluidity, and it is highly probable that excess of Coagulable Lymph gives tenacity. But what are the effects of an excess of Red Globules, or in what cases it takes place is very uncertain. Dr Haubius's reasoning here is not to be admitted; for in the first place he goes on the supposition of these being *Solid* bodies; and even if they were, the conclusions he draws are very Erroneous. There is no proof that Oil is sooner heated or cooled than other Bodies. We can allow that in the Leucophlegmatic habits the Serum is in over proportion; but that in the melancholic there is an over proportion of Coagulable Lymph, or that the Sanguine is a just mixture of the whole is very uncertain. In the Serum it is obvious, that water may exceed in proportion.

As to the 2^d Cause, we don't know that it exists, 95.
at all in the System. The want of Tenacity is nothing
more than the want of coagulable Lymph in it,
and therefore comes under the affections of that
part of the Blood.

~~Lues~~
Dr. Gaubius next considers the morbid States
of the Red Globules. We know nothing of these
except their Immiscibility with other parts of the
Blood, which gives them a determinate size, and
therefore we cannot say much of their morbid
States, or the Causes of these. The Causes too of the
colour of these must be much concealed tho' Gaubius
enumerates several. If Luenhoeck's System is re-
jected, the force of Condensation must be rejected.
The term Phlogiston is very obscure, nor can we
allow of Mucus, Acid, &c.

With regard to the Subrefraction different ex-
periments are produced. Some say that it diminish-
es, others that it overcomes the red colour.

In accounting for the higher colour it is not
probable that it depends on any of these circum-
stances on the Red Globules themselves, but on their
being more or less diffused in other parts of the Blood.
The Attenuation can scarcely be admitted in any
other

other sense. We do not know from any one's experi-
ment that a red Globule of itself is of a deeper or
paler colour. Yet Gaubius seems to think that this
happens, and mentions several foreign matters in-
herent in the blood.

We proceed next to consider the coagulable Lymph.
It is this which gives the Inflammatory Crust. In some
cases the other parts may be able to hold it more in
diffusion, which will prevent its proper separation
from them. Perhaps too this may be owing to
its being too small in proportion. In some cases
it may be owing to the state of its mixture as
Gaubius thinks, but not oft. The spontaneous
putrescent tendency of our fluids goes on to a
great degree may have that effect.

The Lymph too may exceed in its disposition to
concretion. / ()

With regard to this we have already observed
that Nature has provided means to prevent this
from going too far. Gaubius's proof rather favours
our opinion. The application of cold prevents this
separation and concretion. In the case of the
Inflammatory Crust, there is no proof that the
Coagulable Lymph is then in greater proportion,
but is disposed by certain circumstances to sepa-
rate more perfectly. Any Crassamentum from
which

which Red Globules are washed out is equally dense with any Inflammatory Crust.

There are two kinds of Inflammatory Crust; One as described by Gaubius; another where the Crust is spread over the whole surface of the Liquid, more Serum being entangled in it.

All this Paragraph depends on the Supposition that the Inflammatory Crust depends either on an over proportion of Lymph or a greater disposition of it to concrete. With regard to the first we must doubt much of it, if we consider how soon blood is disposed to show this Crust. Thus if a Ligature is put on a Limb for an hour, the Blood shows this Crust. The application of cold is said to produce the same effect. But of the whole of this we have spoken sufficiently before.

We do not imagine that any foreign matter is introduced into our System, so as to produce any Coagulation in our fluids. With regard to the Specific gravity it may depend on the quantity of Water or red Globules, but we know little of the matter.

As to the Elasticity, this probably depends on the quantity of Air introduced.

Q. Succorum Secretorum Vitia. Par. 369.

We come now to consider the fluids in their third state as prepared by the several Secretaries. We can suppose that deviations of the secreted fluids may depend on morbid deviations of the common mass. But as the secreted fluid requires a new constitution during secretion, these deviations may be independent of the common mass.

In the Saline Aqueous fluids we can indeed discern various states of Serenity or Turbidity; but what causes induce these is not at all obvious. Haubius says that these allow the Saline parts to secede; and that these Crystallizing give the Calculous Concretions. This is a curious observation and seems not void of probability; but we do not know how far we may extend these general rules, and we have an instance of these Concretions taking place in a fluid of a different nature, the Bile; this is a fluid of a particular kind, which has long, with Justice, held a great place in our Pathology. Yet we have gone but a little way in explaining its nature, or finding out the manner of its production. We may suppose that the Water or Menstruous part of it, may not

be sufficiently impregnated with the proper matter which may give Inertia. In this proper matter too there may be various Acrimonies, but the nature and causes of these not rightly understood.

The several appearances of the Bile have not been sufficiently noticed; much less can the causes or effects of these be known. There is great room for experiment here.

The Succus Mucosus may undoubtedly vary in consistence & Acrimony, but we know no more of the nature of these, than we do of those of the Bile. We cannot agree with Gaubius that Stagnation produces the production of Acrimony. As the Mucus draws off a portion of Serum which is the proper seat of Acrimony, it may contain Acrimony in it, but does this rather in its fluid state, than from Stagnation, which can only make it retain Acrimony that was before in it, more tenaciously. The several species here mentioned are unknown to us. —

There may be contagion adapted to sieve upon the Mucous Glands. Hence Catarrh is found to be so often contagious. Contagion seems too to modulate in the mucus in most of the Acanthomatous Disorders. The Small Pox very commonly throws a portion of their Acrimony on the Mucous Glands of the Fauces. The same happens in the Measles, Scarlet Fever

Fever, and Inflammation. The fatty Juices are also fit to retain any Acrimony in them, but the Bil is itself a Guard against Acrimony and is frequently used by Nature for that purpose.

Boerhaave supposed that the Acrimony of the Lues venerea had its seat in the Bil of the body. There is no foundation for this except that it attacks the Glands. It seems rather to have a connection with the Mucus, tho' probably not confined to any particular position, but diffuse through the whole mass of the fluids.

Dr. Haubius next mentions the particular Acrimony of Bils, & candidly. This seems to be a kind of fermentation, but its nature not perfectly understood, nor do we know any disease to arise from its presence in the system. The fatty part of our body according to Haubius consists not only of Bil, but also of Mucus, and this aqueous mucosity abounding may produce Leucophlegmasia, Anasarca, &c. This is entirely hypothetical. Our Biliary part may also deviate into excess of consistence, & disposition to this appears in certain kinds of Animals, but we cannot draw any application from this. We cannot agree to the conclusion that from hence arises Induration, Tubercle, &c. The Neatoms in particular are refused to be concretions of the fatty kind.

The milk of Animals undoubtedly differs in proportion of its Ingredients, and perhaps in their qualities. This too chiefly is not solely owing to the Chyle. Thus one Cow in the same pasture will give more milk and butter than another according to the Circumstances affecting the secretion alone, as Age &c. In speaking of the Gelatina Gaubii I do not enter into the notion of M. Senac. (Before) the nutritious Juice is applied to particular parts, it is prepared in the System, but in what manner is still a mystery. We may allow that it may in certain cases be affected with various Acrimonies &c. as here said, but of this we have no certain knowledge. It is probable that Nature has providently guarded against such deviations of this nutritious Juice on which life depends. If Du Hamel's notion of the Generation of Bones is to be adopted, any deviation is probably rather a topical Affection than any general Deviation. If the Fluidum vitale be a matter of Secretion which we are inclined to reject, we know nothing of the state of its Mixture or of its particular Deviations. There are innumerable Mysteries here which we neither can nor probably ever shall investigate. —

Morbi Humorum Relativi. Par. 383.

We now proceed to the morbi Humorum Relativi. There are three sources of this as they differ in Copia, Loco, et Motu.

Quantitas Humorum Vitiosa. Par. 384.

We shall begin with considering the Quantity of Fluids. The proportion of Fluid to Solid undoubtedly admits of great latitude, tho' there is one best proportion, which however it is difficult to discern, even when present.

Gaubeus considers it at first in respect of the whole Fluids to the whole Solids. He illustrates this by the States of Infancy and old age. In the former the fluids exceed, in the latter the Solids. The Temperies Humida is to be referred to different proportions of the several ingredients of the blood, as also the Temperies Siccā.

I consider now that plethora or plenitude of Blood pressing into the Red vessels, and which is now more abundant than is best, proper for the system. The existence of this state seems undoubted. We shall first consider the several species of Plethora. The first is that depending on the quantity, or absolute pletho: &c. Next is the plethora ad Spatium, happening to

be so from the contracted state of the Solids, the quantity of the Fluids not being changed. Whether this should properly come in here as a State of Plethora is doubtful. Instead of being a Predisposition it is perhaps rather the attendant of a Symptom.

Further, our blood as an Elastic fluid may be expanded in its volume, which will have the same effects as absolute Plethora. Next follows a difficult question concerning the Plethora ad vires. This term has been applied in two different senses. It has been applied to a particular degree of Plethora ad molem, where this arose to such a degree as to affect the Actions of the Solids. In this sense it is only a difference in degree & scarcely deserves to be distinguished. This seems to be chiefly what is considered by Gaubius in the several instances he adduces.

The other Plethora ad vires is when the fluids are in proper proportion, but the solids are not in a proper state to transmit them. This doth not deserve the name of Plethora at all. It appears then that what we have chiefly to consider is the Plethora ad molem. Gaubius rather confuses us here by bringing us back to *poluxymia*. What we mean by it is when the Red vessels are preternaturally extended with blood.

We agree with the Systematics in distinguishing
 Plethora vera & spuria, or ad volumen. The Plethora
 vera ad molem is of more consequence and requires
 our strictest consideration. As to the cause of this
 it must depend on a faulty proportion between the
 Ingesta & Secreta. These in a sound state are either
 pretty exactly balanced, or there are provisions
 made by nature to restore this balance; but
 these depend on a variety of complicated functions, &
 Plethora doth undoubtedly exist in the System. The
 causes may be reduced to these two heads. 1. The
 Ingesta being increased the Secreta still remaining
 the same. 2. The Secreta being diminished the Ingesta
 remaining the same.

The first depends on the quantity of Aliment taken
 in, and the state of the Assimilative powers.

The causes that affect the Secreta are as follows. 1.
 The Secreta are more or less, as the state of the
 fluids are more or less fitted for secretion. For
 Aliments are in the first place changed to a coagul-
 able Lymph, a viscid fluid fitted for the purpose
 of Nutrition. This being changed to a saline state
 & mixed with water gets a Consistency, and hence be-
 comes disposed for secretion. Hence saline matters
 introduced with our Aliment keep up the Secretions
 and prevent this Plethora. Animal food as giving
 the coagulable Lymph will be found a less con-
 ducible

spirable food than most others. The food of younger
 Animals is for the same reason a still less per-
 spirable food than that of older Animals. This then
 depends much on their fitness to be converted into
 (bagable) lymph. 2. more or less is thrown off
 by the secretions, as the solids are more or less the
 the quantity of fluids being the same. The impulse
 of the Heart is partly spent in compelling the pro-
 gressive motion of the fluids, and partly in dilating
 the vessels. The more readily these vessels are
 dilated the more will the progressive motion of
 the fluids be lessened and consequently the secretions
 be diminished. A rather circumstance here to be
 noticed is, that the activity of the system is in dif-
 ferent proportion in different parts. The Density
 of the Arteries increases as you recede from the
 Heart. The Dilatation then is greatest near to the
 heart which is the foundation of the filling of the
 vessels and Accumulation of the blood in them.
 The dilating powers of the heart are constantly
 diminishing whilst the density is increasing, which
 preserves a proper balance. In drawing out blood
 from the red vessels we find this is apt to pro-
 duce plethora. The Tension of our solid parts de-
 pends much on habits and customs. There is a
 Lord flexibility to a certain degree, and which one
 removing

removing the stretching power contracts itself to a certain state. But if a weight is appended to it for some days it will not now contract itself as before. So do our vessels seem to be able to accommodate themselves to various states of the quantity of fluids. But they get a habit of being accommodated to a certain quantity. Our vessels seem to distend themselves in order to be accommodated to the quantity of fluids they are to transmit. But it is probable that when a portion of the fluids is taken off, they don't contract themselves again proportionally which will occasion laxity.

Effects of Bloodletting then are to induce Atony on the vessels, so that fluids thrown in are more apt to accumulate, the secretions are slow, and the smaller vessels are not filled like the larger ones are restored to their former state. Whilst the smaller vessels are in this state of increased rigidity, from the late state of the larger vessels the Accumulation in the larger vessels not only arises to its former state, but even exceed that. We must observe here the effects of Introducing a partial plethora in different parts, in consequence of a different proportion of Density or Laxity.

The Density of the veins is greater in proportion

to that of the Arteries in the beginning of life; afterwards the Arteries increase in Density, or come nearer to a balance. This explains why the Arterial Plethora prevails in the beginning of life. In old age the quantity of blood is the greatest in the Venous System and gives a venous Plethora. We must refer to the same the other partial plethoras. Thus the head in infancy is the largest, and furnished with the greatest proportion of fluid. Hence the Hemorrhages and congestions at ~~that~~ that time of life. Afterwards the other parts get more extricated, and increase in proportion to the head. The Pulmonary System is now more nicely balanced with that of the Aorta, whence Hemorrhages so frequent in the Lungs then. As to the Venous it is much questioned whether it is a partial or general plethora. The distension of the neighbouring parts must give tension to the whole System, which will have the effects at least of general Plethora.

There are also various external powers, affecting the progressive motion of the blood & thereby the secretions, as Exercise of Body & Mind. Hence a state of rest and sleep and indolent life occasions Plethora. —

Lastly there are certain powers affecting the secretions

secretions themselves. Thus the Suppression of usual evacuations, as of Perspiration, has great effects this way. The want of the Perspiration is in some measure compensated by the Urine. But still it has a tendency to occasion Plethora. Hence a certain degree of Cold gives a tendency to a Plethoric State, and hence the Animals of any particular kind are ranged in a particular Temperament. Moisture joined with cold in particular favours this. Such are the various causes producing Plethora.

Cauterius next considers the contrary of this. He is disposed to limit this case, and supposes in every gradual diminution of the Ingesta or increase of the Secreta, the Solids are disposed to contract themselves, and preserve a proper balance, so that the want of good blood can arise only from large and sudden evacuations. We cannot agree to this, for we have many instances of the effects of spare diet in this way. Yet large and sudden evacuations must be allowed to act most powerfully this way. We should add here that Aëtiæus has properly introduced a disease, the In or want of Red blood. The French Physicians have indulged themselves in taking away large quantities of blood. Aëtiæus gives two remarkable instances of the effects

effects of this and we have seen the same, even if the Excretion is not of red blood it may act powerfully this way, as in the *Scur Albus* and all purulent discharges, since this is immediately formed in the coagulable Lymph.

Gaubius goes on properly to consider the nature and causes of the Obesity. This is oft confounded with proper Plethora. It arises from the same causes, but is oft the effect of the other Plethora, and may come by degrees to be substituted for it. By straitening the blood vessels too it may give the Plethora ad Stasia. This subject is very fully handled by Haller in his *Elementa Physiologiae*.

If the nature of Obesity is properly understood, that of Emaciation will also be known, and requires no further comment. —

Fluida Loco Aberrantia. (Par. 397.)

We come now to speak of the *Fluida Loco Aberrantia*. It is obvious that most fluids have their distinct seats, and these too confined within narrow limits. Others have wider limits but still are not without their bounds. All these are properly called *Fluida Loci*. Gaubius divides these into 4 kinds 1. *Proprium*
Mercurium

Theentium; 2. Error Impactorum; 3. where the fluids have changed their places ^{enter} into vessels by which they are carried out of the body. 4. where they are passed into capillies not designed to receive them. May there not be a 5th case?

The Error Theentium is of 2 kinds as we consider the sanguiferous system divided into 2d vessels, & vasa minima generum. To the 1st the red globules are confined tho perhaps the Lymph is not. These red Globules then get into the vasa minima generum, this is an **Aberration**. An aberration of more consequence is where fluids more confined are carried into vessels not their own. This happens in the case of the Bile taken up into the blood. This however is not a proper instance, as the Bile when taken up is for guarding against Acrimony &c, and is not carried along in the blood in its proper form. Another more considerable instance is Absorption of the Bile into the system. This too: ever is a proof that the lower surface of the Bile vessels is not very sensible, since in these cases there is oft no remarkable resistance.

The next instance is that of Urine. This fluid may be diffused over the whole system, and un: stop it is pushed into particular canals, as into the ventricles of the brain it continues as a ^{con} _{line}

time, without producing any very dangerous effects.

Next is the Absorption of Excretion. For the Pathologists have had recourse to a particular remedy retained in the system. But we offend the Perspiration retained & compensated for by the Urine without any bad consequences. Even when the Urine is not proportionally increased, it has continued obstructed for some days, & then been rectored without any bad effects.

We cannot refuse that retained perspiration may produce delirium, but insist that the instances particularized by Pathologists are not of that kind & may be explained either another way, as by a change of venous.

The doctrine of concoction and crisis is still involved in great obscurity.

We know of one cause only of Purulence. Whether the Absorptions of various other matters is to be considered as *Error Stantium* is uncertain.

Next follow the *Error Impactum*. As all particles of Solids by their size & viscosity are not fitted to be transmitted thro' all vessels, this *Error Impactum* may arise. Yet we don't know in what cases it arises except in the cases of the red Globules passing into the *vasa minora generum*. This is the famous *Error Loci* of whose existence we doubt much. The

are disposed to believe that the *serice of Valsa mi:*
normum Generum is very short. The vessels too are
 capable of much dilatation, without any bad con-
 sequences, and red Globules do accordingly pass
 thro' them. Further in these minute vessels, the
 Ramifications are very frequent. What gives
 occasion chiefly to this supposition is the conical
 form of the vessels. But the space between every
 Ramification is perfectly cylindrical, which will
 tend much to prevent any such Obstruction. Add
 this that in case of great dilatation & great con-
 striction is also produced, which will drive the
 red Globules backwards. This fact observed by all
 microscopical observers.

From all these circumstances this *Error Loci*
 must be very rare. Dr. Haubius seems sensible of
 this and adds the case of obstructed vessels in
 consequence of Spasm. But this not, properly an
Error Loci, which is never the cause of Obstruction
 in red Globules, tho' Spasm of the vessels super-
 coming may occasion Obstruction.

The *Error Excretorium* is of two kinds.

1. Where the fluids that sh^d not be poured out
 at all, are carried out of the body. Whether the
 Serum is carried off in greater quantity in the
 Diabetes is not very certain. The secretion of
 Urine

still grofser fluids is still more uncertain. The
 2^d case is, where the fluids that sh^d be excreted
 are carried out by passages not their own.

The instance of the Sanguis Menstruus leads to the
 supposition that a particular kind of fluid is pre-
 pared for that secretion in the Uterus; whence it is
 only owing to a change of equilibrium.

The 4th case is the Direct Effusum, which is,
 the most considerable of all & may be called Ichymo-
 sis. A difference arises here, first, from the man-
 ner in which the fluid is poured out whether by
 Anastomoses or other affections of the Solida Con-
 tinentia; 2^{dly} From the Cavities into which they
 are poured, either natural or praeternatural, as
 in Hydroptic cysts. 3^{dly} From the nature of the
 fluid poured out; this may be referred to an in-
 creased impulse of the fluids, as in Sagillation,
 Inflammation, Haemorrhage.

There is another case of increased serenity, as in
 the Ecchyma & other putrid effusions. 4^{thly} From
 the changes induced in the fluid effused. The reason
 of these various changes are not known, as why
 in some cases a coagulation takes place, in others
 a suppuration, and in others there is a reabsorp-
 tion. The Absorbents in their natural state are ca-
 pable of absorbing fluids only of a particular kind.

But if you wound these Absorbents further from their Orifices, they will now take up fluids that they did not before. Suppose that this rupture of these vessels takes place in the reabsorption of the red globules, which explains that Phenomenon.

Next follows the Effusion of Serous Fluids. The various causes of these Effusions we have already delivered in a Table.

(With regard to the corrupted humours this depends upon the change induced in the effused humours. Dr. Gaubius properly adds the case of Air. But in what cases this happens or with what effects it is attended is not known.

As to the question next started we must not be rash in concluding Ossification of blood vessels &c. to be an Error loci.

The 3^d head of Morbi humorum relative is the Bilis Malus.

The various fermentations occurring in animal fluids are carried on by a motion of their parts with a decomposition probably and some change of their mixture. That such a motion is going forwards seems without doubt. But after this general observation we can go no further, nor can we assign the nature, causes, or manner of action of these motions.

Another

D.^r Cullen's Doctrine of Fevers.

Another species of the *Motus bilia* more manifest is a change of the progressive motion of the fluids. This is either general or partial, as it prevails in the whole or only part of the system. Dr. Gaubius here touches upon two of the most important points of Pathology, viz, the proximate cause of Fever, and of Inflammation, but he doth it in a very imperfect manner. The importance of the subject requires that we dwell more fully on it.

Of the *Irritamenta* of Gaubius we may observe that if they continue for any long time, the system is provided with certain vessels or pores which prevent their effects. This doth not account for the most frequent instances of increased velocity as Fever.

We cannot readily refer this to the action of external causes, for these seem to be our intermediate state that of the *tert. lit.* In this there appears very universally an *Inertia* of the system. How these Stimulant powers introduce this intermediate state of *Inertia* is not easy to conceive. It is necessary to look here for another set of causes.

This subject may be considered in two ways.

1st In a practical view as to establish the fact that this
cold fit always takes place. 2^d To &c—

Doctrine of Fever.

2^d To show that this cold fit consists in a spasm 116.
on the surface, which is a stimulus inducing the
increased action of the heart & Arteries, in order
to overcome the Spasm.

The other view, and which more properly belongs
to Pathology is to confine ourselves to this series
of causes, & show how these act in producing
each other. This is a difficult matter, but first,
we can readily conceive that cold applied to
the surface of the body by increasing the contraction
of the solids and by diminishing the rarefaction
of the fluids & the mobility of the Nervous power,
may resist the distribution of this power to the
extremities of the Nerves, and make it to be ac-
cumulated in the Sensorium commune.

2. The nature of the Sensorium commune is such
that there is a certain power there to restore the
system to an Equilibrium making a resistance
to its Accumulation, and pushing it to the ex-
tremities of the Nerves, especially those of mo-
tion.

3. Admitting of Dr. Lister's Scale of Irritability,
with regard to the heart or from custom, or from
it's share in the Equilibrium of the System, the
ordinary inflat thus produced will act on the heart
and larger vessels. The increased action of these
will tend to restore the action of the Nervous
power.

Doctrine of Fever

power to the extreme vessels, they propelling the blood there too, will serve to increase their action and produce respiration & a copious sweat. But, in the next place we must observe that this is not the order always in which they happen. In some cases the affections begin in the Sensorium; thus an object of fear in consequence of certain relations before established, will produce a constriction in the Sensorium commune, which will have the same effects as cold, here then there is the same Accumulation in the Sensorium.

A. It is not difficult to suppose that Miasmata or contagion, the other head of Causes of Fever, may operate on the Sensorium commune in a manner analogous to Fear, or, what is less probable, on the extremities of the Vessels in the manner of Cold.

Its operation in this way is pointed out by innumerable facts.

An Accumulation in the Sensorium will sometimes kill immediately. Further contagion of itself may be sufficient to produce this series of affections; But according to Daind, and others it seldom or never has this effect, without the concurrence of cold or fear. The theory of our has not yet touched another source of Fever

Doctrine of Fever.

Fever very different from the above, viz, Topical Inflammation attended with general fever & febrile hemorrhages. Hence our Theory doth not apply so readily - Yet first we observe that this topical Inflammation arises from a distension of particular vessels - Now this over distension is easy to conceive, for it proves a direct Stimulus increasing the action of the moving powers in these parts.

Further the distention must be communicated to the neighbouring vessels, and the Stimulus may also be extended so as to produce Inflammation. But how it should extend over the whole system is not easy to shew. We may suppose it is by constriction on the part, which gives a Stimulus.

This Stimulus doth not produce general fever without a previous cold fit. This is what gives the greatest difficulty here. - The particular constriction here is by Sympathy said to be communicated to the whole system. But this term doth explain how this communication is produced.

We have formerly evaded this question & hinted that cold applied to a part of the system will produce cold over the whole. The horror here is

Doctrine of Fever.

here is to be supposed a communication of the affection along a continuous membrane, yet even here the Sensorium seems to have a share in the communication. Weaving this I would say that the Sympathy applies only to the external surface, not to the Pleura, Peritoneum &c. Another explanation is to be looked for.

Thus, we would observe that every excretory effort is attended with Urine, as in vomiting, excretion by Stool & Urine, hemorrhages, menstrual eruption, excreta partus &c.

There must be something then in the effects of over distension besides Stimulus to produce this Horror. We may suppose then that it also produces Anxiety, which is universally attended with a weakness of the Sensorium, & consequent by an Accumulation of the nervous power which will operate in producing a general fever. This combines all these cases of topical Inflammation &c. with the Theory of general fever. This Theory might be confirmed by enumerating the several Phenomena of fevers, by an application of it to the several species of fevers &c. But our time will not admit of such a discussion.

This finishes what we have to say on the subject

ject of Fever and Inflammation, Dr Gaubius next 120.
proceeds to the Morbi Compositi. He is sensible here
that this will lead to a very subtle question on his
own plan, and it belongs rather to a practical enquiry,
omitting this then we proceed to consider the Remote
causes.

These are divided into the Occasional and
Predisponent.

The Potentiae nocentes may in certain cases prove
either. These are reduced to two heads properly.

1. The action of external Bodies on us.
2. The actions of the Animal system itself.

The first may also be referred to the applicata &
ingesta, the latter to the gesta. The subdivision
of Non naturals is unnecessary, and the term
itself is ambiguous. Dr Gaubius has not himself
assumed any regular division but begins with the
Air.

In considering his Noxious Atmosphere Potes-
tates, he

1. regards its sensible qualities.
2. Its essential properties. and
3. Its various contents.

To speak of each of these now in order. Under the
sensible qualities of the Atmosphere we reckon Heat,
& Cold, Dryness & moisture. The two first are the
most.

most considerable powers acting on our System. Their effects are to be considered as Absolute or Relative, either in changing from degree to degree, or in respect of the state of the human body.

As to the Absolute heat every temperature less in degree than that of the body would diminish & bring it to its own degree, if the human body was inanimate. But in Animal bodies & especially the human this doth not happen, but rather when continued serves to increase its heat.

If the human body is at 98, an Air of 80 will at its first application feel cold unless preceded by an Air of 70 - But in either case if continued it increases the Animal heat. The first point then to be determined is to say what state of the Air is properly heat or cold with respect to the Animal body.

The mean temperature of the different countries has been fixed upon as the necessary degree of the state of the Air in this respect, by most Philosophers. This agrees perhaps tolerably well with vegetables, but not at all with Animals, we have a power of generating heat within themselves, and we find that this generative power is different in different Animals. No Experiments are yet made on this subject.

But with regard to the human body in this climate
it

Animal Heat

it seems to be at 62 of Fahrenheit's Thermometer, a chamber of that degree of heat being agreeable feeling neither hot nor cold. In any temperature below that we don't immediately find cold unless we get below 60 & nearer to 50. — At 64 the air appears rather warm, at 58 cold and rather disagreeable. Any degree below 62 has either more or less of the effect of cold, above that of heat.

A determinate degree of heat is requisite to the mobility of the fluids, as also to the laxity of the solids, & accordingly best suits the human constitution. This heat is from 96 to 100 — In 90 of the globe men live in a temperature much below this animal heat. Here then a part of this heat must be communicated to the neighbouring atmosphere.

There must then be in men a power of generating a heat of 96 whilst the temperature of the air is at 62. If we take two bodies which have no power of generating heat, as two portions of water but of different temperatures, & blend these together the temperature of the mixture will be the mean between that of the two portions. For bodies thus applied by contiguous surfaces are one getting the other losing heat. But in bodies generating heat it is otherwise.

If we take a furnace we can keep at a determinate degree

Animal Heat

degree of heat, the vessels &c placed in it will arrive at nearly the same degree. But on account of the communication with the air by which the furnace is always losing heat it comes to a particular balance with the not equal to the generating heat is above the mean degree between that & the surrounding bodies. This point will vary greatly in different climates, being lower in cold & higher in warm ones. It must however be observed that it rises in hot countries more than it sinks in cold ones. —

Thus the absolute heat is variously modified by the relative.

Let us consider the effects of absolute heat either on the whole system, or on Respiration alone.

1. Heat gives greater rarity & elasticity to the nerves, hence & consequently greater mobility, and therefore greater sensibility & irritability.

2. Heat expands all bodies, increasing the rarity of all flexible bodies & so of our solids; but this it diminishes the tension & makes it less steady.

This is another source of mobility and particularly of irritability.

3. Our fluids are somewhat expanded by heat in their bulk which gives a distension of the solids. In particular the very increase of elasticity gives greater fluidity. — All fluids we find increased by heat, as
also

Animal Heat

also all intense motions in bodies. One of the most 121.
sensible effects we see is a constant tendency to
putrefaction. It also promotes the Accecent fermentation
in all bodies liable to it. It may probably have
that effect in the human body as Dr. Haubius thinks
- But we cannot admit of this. It goes on to a certain
degree in our Stomach, but there are certain pro-
cesses there either to check the Accecent fermentation
or by mixing with these matters to give them rather
an Al. accecent tendency than an Accecentency. We must
add to all these that from some of these powers already
mentioned

Heat by its own stimulus constantly increases the
action of the heart & arteries, giving a more frequent
pulse, and in consequence of this, perhaps determin-
ing the fluids more copiously to the surface of the
body. But this may also be owing in part to the
Acrity the heat induces on the vessels of the surface.
Hence then perspiration is increased, Urine diminish-
ed. From this determination to the ~~superior~~ surface a
greater proportion of fluids is carried off that way.
Hence the Urine is not only diminished, but is also
made more Acid.

We may suppose the same of Bile tho' we don't know
its precise states of Acrimony.

We must now consider the particular Effects of Heat on
Respiration - -

112

Animal Heat

*We find that flexible Bodies do not increase in their flexibility in an equal Ratio to their increase of heat. If we take Wax or Sulphur these by Friction become elastic, but by increasing this heat they incline to melt & become less elastic. May we reason from this Analogy & suppose some such thing to happen to our Nervous Power, the mobility of which may be increased by a certain degree of heat, ^{but beyond} ~~that~~ ~~it is~~ ~~diminished~~ that is diminished.

We can explain Respiration by supposing the Ap- 123
erture of the glottis sufficient to admit air enough
to restore the balance made by the dilatation of the
Thorax.

The air we breathe is much cooler than our body.
As thus applied then its heat must be increased, & of
course the Elasticity. We must impute then the dilata-
tion of the Lungs partly to the quantity of Air taken
in, but also to the change it undergoes in Elasticity.
This will be in proportion as the Air is more or less
dense. Hence the most cool & dense air gives the
easiest respiration. Where the temperature of the
Air equals 98° , respiration must depend entirely on
the quantity of Air taken in, and hence it is very dif-
ficult then. The fluids too are then viscid & occupy
more room in the Lungs, which contributes to make
the transmission more difficult, whence arises that
debility sense of resistance & languor in the hot coun-
tries it is not easy to say, but probably it depends
on the Anxiety occasioned by this difficult respiration
which as we have before observed is attended with
weakness of the Nervous power; but the effects are not
wise in proportion to the heat.

It should seem that as the heat is increased the
power of generating heat in Animals is proportion-
ally diminished * Thus it is observed by Muschenbroek
that

Animal Heat

that Bodies on the application of heat expand more 126.
at first than afterwards. So the effects of heat rising
from 60 to 70 are greater than from 70 to 80. We
find too that flexible bodies don't increase in their
flexibility in an equal ratio to their increase of heat.
For if we take Wax or Sulphur & remove friction
become Electrics, but by increasing this heat they
incline to melt & become less Electric. May we reason
from this Analogy & suppose some such thing to
happen in our Nervous power, the mobility of which
may be increased by a certain degree of heat, but
beyond that is diminished. Our Blood too seems to
be less liable to rarefaction as the heat increases.
Probably the increase of Putrefaction contributing to
the increase of Saline matters in the blood may
diminish the generating power.

Some of the effects of heat are instantaneous,
some require a length of time, hence the effects of
heat on our System are so much more remarkable
at the end than at the beginning of the Summer, and
in warm climates than in those more temperate
ones - so much depends on the duration of heat.

The case of relative heat arises chiefly from
sensations, it must therefore depend rather on the
state of the Nervous power than on any given force
of the Impression.

How

Animal Heat.

How far this is independant of absolute heat, is 127
not certain; it seems less certain than relative cold
is to absolute. In degrees below 62° the Impression
is agreeable & pleasant & therefore makes less Im-
pression. The degrees above that are painful & have
a stronger Stimulus.

But relative heat is particularly to be considered
with regard to its effects on Solids & Fluids.

It expands the fluids more readily than it re-
laxes the solids. This however is different at
different times. Fluids in their denser state are most
liable to rarefaction, hence the greater effects will
rather be below 62° than above it; thus a change
from 40 to 50 will rarify the fluids more in proportion
to the solids than from 70 to 80 . There is another
reason for this at 62° there is a proper proportion
or balance between the solids & fluids, below this the
solids are more contracted, above it more relaxed.
In this last case then the solids yielding more readily
will abate the effects of heat. Inflammatory af-
fections & particularly Rheumatism depend on this
proportion between expanding fluids & contracting
solids. Hence Inflammatory Diathesis prevails,
most in seasons & climates where the degree is
below 62° , and particularly in the Spring when we
experience

Animal Heat

superfices on the cold of the winter. Further 128.
heat increases the Alcalescent or putrefactive
state of the fluids, it however in very few in-
stances shews putrefaction actually produced.
Animals exposed to a great degree of heat im-
mediately become putrid, but in ordinary states
of the atmosphere this will not happen tho'
it appears to do so.

Heat occasions an increased exhalation from
the Lungs, which if reabsorbed is poisonous. The
perspiration is probably much of the same
nature. If heat occasions putrefaction it is owing
to the Animal being inclosed in a small por-
tion of Air, so that this poisonous matter is
not allowed to escape. So much for the effects
of heat on the System in general. It will be easy
to understand what are its effects when applied
to particular parts of the System. Heat at the
degree of ^{only} reaches to the Pale Mucosa, pro-
ducing Blisters. At a higher degree it gives
Inflammation affecting the texture of the part.
It isb it coagulates the Animal fluids, and some-
what higher it is an actual caustic.

With regard to Cold we have already fixed its
Limits. We are exposed to degrees much more
below

Cold

below 62° that is in the atmosphere 1 than 60 degrees above it. Add to this that we can bear this extreme much better than the approaches to extreme heat.

Our reason is, that on the side of cold the power of generating heat is increased as the cold is increased; for the tension & firmness of the Solids are now increased, which contributes to the generation of heat greatly. Besides this too, the exhalation of the body is intercepted between the body & the surrounding air. This is the foundation of Cloaths & houses in order to confine to our Bodies a certain portion of what may be called our own atmosphere, and thus, not allowing the Air in contact with our body to be much changed.

Further we guard against cold by Fuel, but we have not these advantages on the side of heat — This is the first effect of cold when applied in a stream to carry off our atmosphere.

The Effects of cold on our System are

1. A Condensation of the Nervous power which diminishes Sensibility & Irritability.
2. A Condensation of the Solids giving more force & tension.

Effects of Cold.

3. A Condensation of the fluids, thus diminish-
ing their expansive power.

The Effects of Heat pervade the whole System, &
those of Cold affect only the surface, & don't reach
further into the System than as the whole tem-
perature of the body is altered which for the above
reasons can seldom happen; hence the Condensa-
tion of the nervous power seldom takes place;
hence too we have no effect opposite to that of heat,
by which intestine motions are increased.

We must now mention another circumstance
preventing our opposing the effects of heat & cold.
Cold is as well as heat a Stimulus which is suited
to obviate the other effects of Cold. We have frequently
observed that there is in our System a constant
tendency to restore its balance. This is a remark-
able instance of it. Whatever tends to diminish
the tension of the System if not in the strongest
degree proves a Stimulus & so obviates its own
effects. Cold may also follow the case of relative
sensation. If it falls below it proves a Stimulus,
& the more the lower it goes. Dr. Witheringham
observes that in falling the effects are always
the same as whether from 80, from 70, or from 50
to 40. We draw some conclusions from this
w.c.b

Action of Cold

which cannot be admitted. The degree of change 131.
of temperature being given, the change in the
system will be greater according to the preceding
heat of the system.

Cold acts in two ways.

1. particularly on the vessels of that part to which
it is applied.

2. As a general Stimulus to the nervous power, &
both these make it prove a Stimulus to the whole
system. The sensation then may be equal in,
whatever part of the scale the fall happens.

Tho' the particular Stimulus may be greater
as the heat of the body is greater, yet its effects
on the mobility of the nervous power will be e-
qual. — It is said that Cold acting as a Stimulus
is not to be considered in its highest degree, for
then it may either destroy the mobility of the ner-
vous system in general or may overcome the
balance so far as to occasion Death.

It cannot impede as you might think the Sleep &
Death which happen in extreme cold to freezing,
as they occur long before the freezing comes on.
When cold is applied in such degree as to constrict,
the vessels very strongly it will have different
effects according to the state of the system & the
force of the circulation. But when applied in
such a degree as to overbalance the power of the
sensorium

Action of Colo.

Sensorium its effects will always be the same.

Every one observes that the effects of the same degrees of cold are different at different times, & so in different persons at the same time. These effects are always corresponding to certain conditions of the body, which is according to the vigour of the system & the strength of the sensorium.

We observe that the body is more exposed to cold in rest than in motion, this particularly appears in sleep. The same happens after considerable evacuations, after previous diseases, fatigue, excessive venery, drunkenness. A state of fear also contributes to the same. We must add to this contagion which we observed to act on the sensorium in the same manner as cold & heat.

We need not add how cold produces Secret. cold, as applied to the surface determines the blood to the internal parts, whence the Urine is increased; but in many cases this determination may be to the Intestines giving a Diarrhoea or promoting the Secretion of the bile. The determination to the Lungs acquires particular notice. What is the connection between these & the surface?

In every Accumulation to the internal parts the Lungs must have their share, but there seems to be something more than barely this. We must apply here what was before said of the constricted solids & expanded

of the Effects of Moisture & Dryness.
or Dryness

expanded fluids. We have so many ways of guard-133.
ing against cold that its noxious effects do not so
oft happen. But when it does take effect we shall
have that proportion much altered - hence we may
understand the foundation of the Inflam.^d Diathesis,
hence too it appears why the Angina, Catarrh, &
pulmonary inflammations, constitute the chief in-
flam^d diseases, if we add Rheumatism too we shall
have 40 out of 50 cases.

The last observation to be made is that transitory
cold, tho' to a considerable degree will have its ef-
fect than a smaller degree long continued. This is
easily explained by the sensorium being prepared
to obviate its effects. hence cold with moisture
is so effectual that it seems to exercise a power of
generating cold. - Cold is remarkable for increas-
ing the appetite of hunger - but diminishes its
This depends on the theory of Appetite, which is
not yet fully explained.

We have hitherto spoke of cold as occurring in the
ordinary states of the Atmosphere. The effects of
higher degrees will be easily understood by consulting
Dr. Gaubius on this head.

We are next to consider the moisture & dryness
of the Air, and

1. Dryness. In the state, wch dryness occurs in these
climates it is always salutary, and it is only when con-
curring

Moisture

-curing with states of temperature, above or below 62 that it can be noxious. When joined with heat it increases perspiration, & thus the exhalation of the more fluid parts & increases the Acrimony of all the internal Secretions; hence it is found to produce various Bilious diseases.

When joined to Cold it increases its effects, partly by carrying off the exhalation, partly by that exhalation generating cold & so constantly applied to the surface. These effects are inconsiderable & as there is a stream of air applied to the body; hence we would explain the singular effects of North East winds. These have been supposed to bring with them frigorific particles, which we cannot admit. Their operation then is to be derived from their dryness. From the same theory we wd suppose that this dryness increases the effects of heat, yet it is not improper but by its sudden exhalation it is one of the means of tempering heat, and a moist warm air affects us more than a dry warm one.

With regard to moisture we must observe that the water of the Atmosphere is in two different states. Air in its driest state contains much water, but it is then so dissolved as not to affect its dryness. This is only to be separated by a diminution of the menstruum or of its density. But moisture in this state is not attracted by the human body tho it is by birds.

Moisture.

2. But another state of Moisture is when it is diffused in the Air - this diffused moisture the Air gives to every body drier than itself - In this state it may be absorbed by the human body when that is in an absorbent state. 135.

Hydrometers tho' they attract dissolved waters don't give us an proper Indication of the Absorption by the human body. But it is the case with those that have been yet employed that at first they give a tolerable measure of the Moisture of the Air, but not after a few days. To speak now of the effects of moisture. The first is the giving increase to the effects of Cold, by giving occasion to the generation of Cold & applying that constantly to the surface of the body.

Moisture with heat occasions an accumulation of the perspiration which keeps up the heat. by this too it relaxes the Solids and vice versa to expand the fluids.

Further, Moisture present in any portion of Air is always a mark of it's being stagnant. unless when it is immediately induced by a stream of moist Air. The power of Air as a menstruum to water has it's limits and the nearer it is to saturation the slower will it absorb our Exhalation, and the more readily will it admit of Precipitation. - Any moisture that can arise from

Gravity of the Air

from our globe if diffused over the whole atmosphere - 130.
where will be dissolved in it, nor can it fully saturate it. Stagnant air has considerable effects by its moisture, but further also by its increasing putrefaction. It is moisture which confines our perspiration about the surface of our body, especially as combined with Stagnant air. Add to this that it increases the putrefaction of surrounding bodies. It is probable that contagious miasmas so diffused will become innocent & that it only acts as accumulated in a certain portion of air.

We next speak of the gravity of the Air. The weight of it on our bodies when the Barometre stands at 30 inches tho' we are not conscious of its pressure is 150000. It doth not even act on liquids & only on elastic vapours - But there are many observations shewing our bodies to be affected by a diminution of this weight - We may conceive our fluids to be in motion to sustain Air which is kept in balance by the surrounding Air, & if this fact is diminished it will be expanded & give distension, and from this largeness of the fluids many harms may arise. Notwithstanding this some philosophers reasoning many phenomena are not to be accounted for this way. We don't feel any sensible effects at mounting to a very great height. The French Academics ascended mountains where there was no atmosphere was taken off and yet there were no considerable effects felt except on Respiration and nat. co.

Noxious Effects from the Contents
of the Air. Exhalations.

only in motion: hence it is scarcely credible that the falling of 1/2 of an Inch can have any great effects on our System. — This problem is not easily solved. 137.

We don't know the state of the Air in our Membranes whether it is exhaled, how it is supplied &c; or whether it counterbalances the surrounding Air.

The great increase too of the pressure of the Air has very little effect, as we see on descending into very deep mines. Even in the diving bell the effects produced seem to be from the pressure not acting equally on the body. The effects then of the fall of the Mercury in the Barometer must be either referred to a change of temperature or to the effects on respiration. Some very irritable people are liable to Haemoptoe on small changes of the pressure of the Air. So much for the qualities.

To speak now of the noxious effects of the Air with regard to its contents.

These are numerous and of great variety if we consider the various exhalations from our Earth. The fossil kingdom supplies these very copiously which arise sometimes from very great depths. Some false effects are attributed to these as a person finding very salutary effects from poisoning the, though he smothered the new turned Earth, &c. &c.

The vegetables are a still more considerable source of exhalations. These not only furnish much matter; but it is considerably diversified by passing thro the

Organs

Exhalations.

Organs of various plants. Animals too afford a large proportion of Effluvia to be taken up into the Atmosphere. In certain places we may see the Fossil exhalations arise, as also the Vegetable & Animal ones. Another large source is from human Excrements &c. of which we have plenty here in Edn. we don't know the effects of these in general, & their particular influence must be very uncertain.

There is certainly a power of mixture in our Atmosphere rendering these various matters innocent.

There is still further the power of diffusion which can render the most violent poison innocent. If we inclose a growing plant in a glass receiver it will in a very short time have its Effluvia putrid, yet we don't know any noxious effects of vegetable exhalations as taken into the Atmosphere. The most deleterious poisons are rendered innocent as appears from the state of the Air near dead swine which is very noxious the day of the week, but innocent on Sunday.

Putrid Effluvia are noxious to Animals, yet even in these it is difficult to say in what circumstances they act. and when an abundance of putrid Effluvia produces noxious effects it appears to be a putrid miasma of a particular kind, and in a very concentrated state.

We must add that probably what is attributed to putrefaction relates only to a particular part. This is the putrid Air which is a very violent poison, human therefore in smaller doses occasion various diseases.

The

This Air arises from various sources. It is the Spe. 139.
cific fossil exhalation occurring in several mines.
It arises copiously from all burning bodies, all
animals, all putrefactive & fermenting bodies.
From one or other of these sources all stagnant air
that has communication with other bodies becomes
impregnated with Mephitic Air.

The Air is not corrupted by Stagnation, but only
in consequence of communication with other bodies.
This then demands our most strict attention. We know
it only by its sensible effects on Life & Flame. Yet it
is probable that it is variously modified so as to have
different effects on the body. In what circumstances
are these noxious qualities of the Air induced? Or,
what favour these Impregnations? What occasions
Heat, Cold, Moisture, or Dryness? These belong to various
other branches of Science.

(We next consider

Noxa a Cibis et Potu.

The Animal Economy is suited to such a variety of
food that by habit it can be reconciled even to those
that are noxious. Further food of opposite natures pre-
vents each others effects. There are also certain pro-
visions made by nature to prevent these effects.
Many kinds too of excess in Diet don't operate like
they have continued long in the System.

(We shall proceed to consider the subject in the
order of Dr. Traubius, who 1st considers

1 The

Errors from quantity

1. The Error arising from quantity.
2. Error from the disposition of the solids & fluids.
3. Error from their qualities.

To this we add the Error of food taken in with a view to Manducation to finish the difference of time in eating & drinking.

Now 1st of the Error from Quantity.

We cannot ^{consider} this as affecting the Stomach, & thro' that, the whole ~~whole~~ system immediately. For

1. Aliment considered in quantity first affects the measure of the Stomach.
 2. It affects the Stomach with a view to Assimilation.
 3. Thro' the Stomach it affects the system with Fever &c.
- We have no measure of the proper quantity of our Aliment, but the satisfying of our Appetite. This depends in a certain degree on fullness; it has therefore a manifest connection with the bulk of our food. — what the due degree of distension is is difficult to say, but it is different in different systems. We can gradually accustom the Stomach to receive more & more food, thus it creates an artificial appetite which is attended with the effects of Plethora.

We may observe in general that vegetable & animal food differ greatly in this respect. — vegetable food has a proportion of nutritious matter less than animal. The large distension then by vegetable food has not equal effects in producing Plethora with that of animal

mal

Pathol. G. 150.

Excess in quantity.

mal food. This gives an important lesson in point of our diet. If then we take vegetable food it will fill our stomach without inducing plethora or other effects in quantity with regard to the measure of the stomach. If the stomach is very largely distended the pylorus is raised up, which prevents the Aliment from passing off so easily, and further its bulk is still increased by the fermentation going on there. Hence it must be thrown off by vomiting. It will also have all the effects mentioned by Dr. Gaubius. He joins to this what we consider separately, viz. how this distension prevents Assimilation by causing an over distension of the muscular fibres & preventing a proper discharge of the gastric liquor, by the quantity of the Aliment being in an over proportion to these liquors &c. &c.

Further, excess in quantity prevents an easy digestion — This produces various effects on the system, &c. among the rest Fever. This however will depend much on the nature of the food, as being more Stimulant, more difficult of solution & perhaps of Assimilation also. — We know the bad effects of it when concurring with other febrile disorders: But independent of these it has a great share in wearing out the system. — It is surprising that this is omitted by Gaubius.

Lastly, excess in quantity occasions plethora. The measure of the proper quantity depends on the

Defect of quantity,

&
due proportion between fluid & solid Diet.

112.
Secretions & Excretions, and if these are properly balanced these effects will be greatly diminished. But the more food passes thro' as the more all our functions are exercised which must wear out the system. Further the balance of people living in this manner is very nice & easily disturbed; tho it has been said that more or less food is of little consequence, yet it is allowed to be of great consequence where there is a tendency to plethora. - I thus have therefore erred in advising them to take in more food, if at the same time they use more exercise.

On the other hand, defect of quantity may be attended with bad consequences, but we are disposed to think that this must be carried to a very great length before it produces them, and that it seldom in fact happens unless from necessity.

We have before spoken of the effects of the spontaneous degeneracy of our aliment & the necessity of fresh supplies. There is much fraud in the case mentioned of excessive abstinence.

We shall next treat of the due proportion between the fluid & solid diet.

That there is a due proportion necessary to perfect health is certain, but what this is, or what the effects of a deviation in this respect are is difficult to say. We think that this must be carried to a very great length before it is attended with the bad consequences
(here)

Qualities of Food. Gault: § 457

1st Chemical, as in

a. Consistence.

b. Mixture

Faults from Consistence.

1. Vivid.

2. Oily.

here mentioned from charging the state of con-
sistence of the fluids, or rather that it can scarcely
ever have this effect. An over proportion of solid
food may perhaps induce Asthema but of the fluids
may prevent it and be rather healthy.

We must not consider the Qualities more
particularly. And first the Chemical ones or the faults
of consistence & mixtures. Those erring in consistence
and liable to give Spissitude to our fluids are of two
kinds, viscid and oily. When a cause acts only in
the internal parts of our system we are liable on
many accounts to be mistaken with regard to its
operation, especially if we judge of these from the
sensible qualities they exert without the body. We
must therefore be cautious in supposing the qualities
of our Aliment to take place in our fluids. This ob-
servation particularly applies to viscid food. Nine-
tenths of mankind live on Farinacea, and yet we
discover no bad consequences from this.

We would not refuse the existence of viscid food
but we don't know when it doth or what are its
effects. Something of the same kind may be said
of the oily food. We are more ready to think
that oil doth not retain its proper form in our
fluids, and that it appears in the cellular membrane
it is evolved by the powers of excretion. It is
variable,

probable that the Oil enters into the composition of our fluids as a mixt, yet as ever abundant, in the mixture it may be the cause of Plethora, Plethily &c. Dr Gaubius has a particular Theory here about his mucus Iners, the existence of which we entirely reject. These oily matters degenerating may introduce a vitious acrimony into our fluids. With regard to Oils in their rancous state we are still more uncertain about their effects and they act very differently on different stomachs. Perhaps their effects are confined to the Stomach, & if the Stomach can bear them they will perhaps have no farther effects on the System. So consider now the faults of our Aliment with regard to mixture.

We shall first consider our Aliment as vegetable or Animal. The vegetable is to be considered as Fermentable or Fermented. It is all capable of, & undergoes fermentation & undergoes this in the Stomach. Now if the noxious effects are to be attributed to what happens during this fermentation in the Stomach. There is then a Gas Sylvestre generated, which is absorbed & dissolved by the Saliva and other fluids according to Dr Pingle. But

in certain cases, as if too great a quantity of fermentable food is taken in, or these fluids are not properly applied, a flatulent gas may take place. This is chiefly a Mephitic Air, and as such Air destroys the Mobility of the Nervous fluid we may easily conceive its effects. It is a very expansive fluid and expands very unequally whence unequal spasmodic contractions in the Stomach attended with distension, vomiting &c &c. If it gets into the Intestines it may produce Diarrhoea, Colic Motus &c. What sort of food chiefly contributes to develop this Gas Sylvester it is worth while to consider. Sugar is the very basis of fermentable matter & so may be easily supposed to have this effect. Gaubius goes further and supposes that it attenuates our fluids. If carried in its entire form there it might like other neutral salts have this effect; but we cannot suppose that it is so. As to their flatulent effects these are properly to be considered as they contain more or less Air. The Legumina seem to contain more of this than the Cerealia. Wheat Aliment seems more liable to remain long in the Stomach, and to produce this high state of fermentation according to the firmness of their Texture.

We have spoke of the Gas Sylvestre as a mephitic air. This probably is variously modified as variously impregnated perhaps with some subtle acid &c.

To consider now fermented vegetable food. Tho' we refuse the existence of Acid in our blood vessels, yet as taken in in too large quantity and so entering into the composition of the fluids they may have those noxious effects. What these are we don't know. They unite with the bily parts & dispose them to pass off by the secretions, whence their use in preventing or removing acidity. Acid probably gives our fluids more of a saline state. With regard to their Acescent state we would allow that they may dispose our fluids to deposit their Earth, whence Gout and Calculus, but even this is not without doubt. For in fact there seems a great deal to depend more on a particular constitution of the System disposing it to produce fluids of such a nature than on the effects of Acescent food on the fluids. As the sapid so the vegetable Acids cannot in all probability be taken in in sufficient quantity to produce any such effects. In some gouty persons a bottle of wine will bring on a fit of the Gout. As so many Phenomena show the connection of the Gout with the Stomach

we would rather attribute this effect of their operation immediately on the Stomach than to any Acrimony they diffuse over the whole System. As Fermented liquors contain Alcohol, they are next to be considered.

These containing some matters not properly fermented they may still be supposed to act on the footing of Acidents, but this will not extend beyond the Stomach. A matter as containing Alcohol doth not affect either our Solids or Fluids. Alcohol coagulates the fluids out of the body & hardens the solids. But these effects are always frustrated in proportion as the Alcohol is diluted with water which it will always be in our System so as to have more of these effects. Wine then or Brandy must be supposed to act merely on the Nervous System, which it doth first as a stimulus afterwards as a Narcotic. The increased action of the Heart & Arteries induced by it is from some unknown cause determined to the head, whence it's sensible effects there. Afterwards it impairs the Nervous power producing Inert ideas state of sleep during which the Stimulant effects subside, but the body is left weakened, irritable, anxious, & related to Potentia Nocentes. These are the effects of

of the Vegetables as Alescent which probably contains 148.
the wholes of their effects. Gaubius further considers
their Alescent effects, but these we cannot allow.
He considers them with more propriety as Aromatics,
but some of the effects imputed to them as such cannot
be easily supposed. Most of their effects are to be
attributed to their Stimulus on the Nervous
System. By this they promote the Action of the
Stomach which prevents the Alescent fermenta-
tion from running too high, hence they are es-
pecially proper in the warmest Climates. By their repeti-
tion they may weaken the tone of the Stomach
but what effects they induce on the System is
less apparent.

We are now to speak of the various effects that
may arise from our Animal food. This as con-
taining the most nutritious food has the great-
est tendency to produce Plethora. It is too the chief
Source of an Alescent state in our Juvs. In
what circumstances this effect of animal food par-
ticularly occurs is not easy to say. It is doubtless
more as it is more or less putrid before it is
taken in.

It appears probable that without a cold climate ob-
structing perspiration, or some such cause, this
Anima?

Animal food will not induce putrefaction (19).
Perhaps even would not do it then if it was not
for the common salt in diet provisions, we may
have a share in inducing an Ammoniacal State
in our fluids. It is proper here to determine what
are the effects of over proportion of vegetable or
Animal food in our Aliment. It is plain that
Man is intended for both, and many instances of
persons subsisting long on one or the other without
harm. It seems agreed that Man cannot live on
Animal food alone, but it is doubted whether
a Man may not subsist on vegetables alone. Se-
veral instances of this in fact as in the Caribs
who are said to enjoy very good health and live
in general long lived, many instances too of par-
ticular persons in these countries. It seems probable
then that if they avoid the bad effects that would
arise in the prima via men may subsist on vege-
table food alone, but it may be doubted whether this
would fit men to undergo the labours of civil
Society. Perhaps Animal food is necessary to
enable men to resist several potentia Maligna acting
on their System, especially Cold, hence more Animal
food is used by them as they reside more from the
torrid zone. We can surmise then that vegetable food

is sufficient to support the system independent of the affections of the *Primo via*, and that in persons of a sedentary life, in a temperate climate, & defended by cloaths & houses the life Animal food is used the better

We shall next consider the sensible qualities of our Aliment as heat & cold. It is proper to move a question here, what are the effects of food a little below the Temperature of the human system in opposition to food taken in below 62° & appearing cold. It is sufficiently obvious that drink taken in cold is at first a Stimulus to the Stomach then to the whole system, & is very salutary. Drink approaching near to the human heat doth not give this salutary stimulus. It has been even the effect of relaxing the Stomach & system, tho' this operation is difficult to understand. It seems not without some reason then that an eminent physician laughed at warm Tinctures given to warm the internal viscera. Yet we cannot agree with him, but suppose that any additional heat will occasion an accumulation of heat in the internal parts which are always losing to the external ones as these are to the external Air, & that the relaxation induced by warm drink is owing to the increase of heat. The bad effects of Sea Breezes oft been handled

but even much exaggerated by Dr Gaubius. Many of them would arise from an equal excess in the quantity of cold water. Warm Water considered in any respect has not the effects here attributed to it. The chief effects of Tea drinking is to be referred to the herb itself. In a strong dose it may prove Emetic, and all such matters seem pernicious to the system. It has particular bad consequences in relaxing the tone of the Stomach and in producing the effects derived from thence. But many of the effects mentioned here arise from a complicated cause, sedentary life, warm chambers, loads of venery &c.

Views of the effects of Cold. When cold liquor has, the effect of Stimulating the fibres & constricting the Vessels & it will have the other effects mentioned by Gaubius. But from its various uses with impunity it appears how much the effects of Cold depend on the relative state of the body. It is a matter of importance to determine when it is proper in fevers to throw in cold or when warm drinks. We generally avoid Cold Drink in these climates but it was much used by the Ancients. We would say that as Cold drink has remarkable effects in inducing a fever

in Inflammatory states the use of it would be dan- 152.
gerous. On the other hand in all general fevers
cold drink is the most proper. Accordingly in Rus-
sia it has been practiced to use cold bathing & wine
Fever particularly the Plethoric ones. In the whole
cold drinks are more proper in warm than cold
climates, in summer than winter.

There remain only now two particulars, not the
effect of too little mastication. The want of this,
must retard digestion & by keeping the Aliment too
long in the Stomach may have the effects imputed to
it by Gastritis. The last particular with regard to
diet is relative the time of eating & drinking. The
natural rule at this is the presence and absence of
Appetite; but the affairs of Society require stated
times which our system easily accustoms itself to.
To frequent meals besides the effects here mentioned
will have that of increasing the secret which we said
prevents it at this time. It has been disputed what is
the most proper time for the principal meal. This ought
to be before the body has been properly exercised.
The chief exercise of the day ought to be over pastis
reason too that exercise is not proper as a first
meal. Exercise of the mind equally prevents digestion,
It is reckoned very pernicious to sleep on a full sto-
mach. but we find a natural propensity to sleep
after

after a full meal and this extends to other Animals. The bad effects of full suppers must rather be imputed to some other cause. We have before observed that there is a constant accession of Secret in the evening in our System, and the aggravation of this fever by a full supper will perhaps account for this problem.

It proceeds now to speak.

De Intempestivo Remediorum Usu.

This is properly confined by haubius to the improper use of drugs in general, nor can it touch their particular effects. It speaks only of the mischiefs arising from the use of Drugs when they are not necessary. Medicines don't like Aliment enter into the Composition of our Solids & fluids, but alters their state and condition greatly. If the body is then in the best state imaginable this change must be for the worse. It is allowed in opposition to this that some Medicines act only on the vicious matters they meet with in the system, & if they meet no such pass off without operating at all. This is said to be the case with Absorbents, but this is fallacious, for Acidity is always present in the Stomach. It's presence is necessary to Assimilation, & if when too great a quantity of it is not present it is taken up by Absorbents this must be attended with

with bad consequences; accordingly absorbents are said to promote putrefaction. The position extends to all other medicines, to that are none which are capable of doing good that cannot also do harm. But further, Medicines in small quantity in general make very great changes in the System and are justly observed to approach very near to this one by Gaubius. This will make us very cautious in their use when they are not necessary. Even those capable of no great effects may be hurtful. In the first place the body being habituated to them will not have the benefit of their effects in sickness. A good old Observation is that the first Administration of blood letting seldom fails to cure the disease. But further, the use of Stimulants makes us insensible to natural Stimuli. This often happens in persons who have accustomed themselves to the use of Purgatives. In general the use of all Meds induces a variety of habits which become necessary and expose us to various hurtful causes. *Sic ut Medicos & Medicamenta sic et ipsa salvas* was the admonition of a German physician. The opposite conduct of this induces various ills. Persons on the least change of their System have recourse to Physicians when these changes would have been spontaneously obviated or attended by the body's nature.

Nature Conservatrices. But it is said that the
predisposition may be corrected by the means of
Physic; this however is best done by Regimen and
not by Medicines. It would be worth while to
consider whether that variety of life recommended
by Celsus is to be followed, or a strict regimen suit-
ed to particular predispositions & particular
times of life; But our time will not allow of
this.

We proceed now to speak of Poisons. We cannot
speak much of this without entering into too large
a detail, so we must speak of these in general.
The first thing to be done is to limit what are Poisons.
Perhaps we must be contented with the vulgar
notion that Poisons are such as being conveyed
into the body in small quantities have a tendency
to destroy life. Gaubius seems to exclude Mechan-
ical Poisons in his definition. It were to be wished
that we could determine what Poisons act on the
Nervous power. The enumeration of Gaubius is
extremely correct; his Mechanical Poisons must
be excluded if we allow a *vis singularis* to poisons.
The next class is of the *Actia Chemica*. These shall
we confined to the Caustics & Corrosives or such as
have the power of destroying the Texture or
mixture of the system. Where these directly
destroy

destroy the part to which they are applied we can
 not consider them as poison. Neither can we in
 another case when they affect the whole system in
 consequence of an affection of a particular part,
 to which they are first applied. The 3^d head is of
 those possessed of a remarkable poutrifactive power.
 Any substance that is introduced in small quanti-
 ties has the power of a stimulating the mass of fluids
 and making them putrid may be allowed to be a
 poison. Some are supposed to affect the mixture
 of the fluids as Laurel water. The greater part
 are such that acts as ferments. We would doubt
 this much whether any can act by chemical mix-
 ture. Even the ferments come to rest first on the
 nervous power, and in consequence of the stagnation
 by induced distor the system more to putrefaction.
 What follows are such as act on the nervous power.
 The first are the Astringent Poisons observed in the
 salts and particularly lead. These induce constric-
 tion on the part to which they are applied, but act
 more readily on the living than the dead fibre.
 Their effects are propagated from the extremities to
 the origin of the nerves. This constriction is with-
 out any considerable stimulus diffused to the rest
 of the system in which they differ from Narcotics.

The last are what immediately affect the vital principles. Of these the chief are the Sedatives and narcotics whose effects are diffused over the whole Nervous system. But Laubius observes that they may act in a more narrow besides the mobility of the Nervous power being destroyed; his observation seems confirmed by the Phenomena observed of various poisons. On the whole of this subject, I would observe that Dr. Ferberdon has given lectures on this subject in the College of Physicians. If he has not made any great discoveries he has corrected several Errors. I would adopt his division of Acrimonious & Intoxicating if he did not contain several of the Chemical Acids under the Acrimonious.

Dr. Laubius next mentions two principal heads of Miasmata and Contagion, which if to be considered as Poisons are of the utmost importance in Medicine. These two terms ought to be carefully distinguished. Miasma implies any contents of the Air which may be noxious to the human body. It seems to be then any corruption of the Air. Where Miasma is used in opposition to Contagion we must either exclude Communication or suppose it unknown. Contagion always implies a matter in the Air which

when introduced into a body has the power of mul- 158
tiplying itself so as to be communicated from
that to another body. In many cases we are un-
certain when the disease arises from Miasma
or Contagion, and therefore refer it indiscriminately
to either; even Sydenham uses the term Miasma
often rather than Contagion. But the extending of
Miasmata too far is attended with errors in prac-
tice and causes unnecessary fears. Most Epidemics
depend rather on Contagion than Miasmata since
we can in general have them as arising from con-
tact. Even the Miasmata in the Air have probably
arisen originally from the human body or from o-
ther animals analogous to it. Even the effluvia from
a sound human body may be reabsorbed by other
persons and prove hurtful. The Effluvia of persons
inhalant are oft born by them with impunity, probably
from habit when they are very prejudicial to others.
This explains the use of Contagions which probably
arise from human bodies or those of similar Ani-
mals and which may perhaps be innocent to the
persons from whom they arise. The Effluvia are
changed by mixture or diffusion in the Air, so
that it is probable they are never carried far from
the person affected; hence they are accumulated or
concentrated

concentrated in these chambers, which will be more or less according to the free ventilation of these chambers. We further find the contagion ad here remarkably to the cloaths &c of affected persons and for a long time adhering to them; hence contagion is chiefly propagated this way. Dr. Gaubius insinuates that miasmata may be from all the sources affording inhalation to the Air. This is possible, but we must not think of possible sources, for from the powers of mixture & diffusion in the Air they will be connected. We have already said that the various contents of the Air may be referred in general to Mephitic Air.

We attempt to correct this chiefly by diffusion, because we know little what mixtures can do. This however deserves our most serious consideration; if we can mix the Mephitic Air with common Air we may prevent its bad effects in general. There is much Mephitic Air at the bottom of wells. But this is connected merely by alternation of Buckets going up & down. This may have consequences on our practice in several cases, but this mixture with common Air cannot always be procured. No matters that have so much the power of fixing Mephitic Air as burning

burning bodies particularly Sulphur. This ap-
 pears to be a curious problem how matters with
 themselves afford this Mephitic air can possess
 the power of rendering it innocent. The fact how-
 ever is evidently proved in the case of fermenting
 liquors where a small quantity of burning Sul-
 phur will immediately check fermentation. The
 mephitic air has various bodies adhering to it
 which may be affected by the acid of the Sulphur
 fermentation with & would be a convenient ap-
 plication to destroy Mephitic air. The burning of
 Gun powder has also been used, the explosion here
 by the strong agitation it gives to the air probably
 shakes off the Mephitic air more powerfully. In
 a late West India War there was a ship with Con-
 tagion of Board which subsided in spite of all
 the means used to correct it. 28 Barrels of Gun
 powder were used in that ship, and the Contagion
 appeared no more after the blast. So far as Con-
 tagion acts as a poison it confirms our theory with
 regard to Fever. Some contagions act more readi-
 ly others not without the concurrence of Heat
 or Cold according as the vigour of the vitæ
 principle is more or less. It is observed by
 writers

writers on plagues that new married men are
 more exposed to the plague, it is probably owing
 to the relaxation of the System. Dr. Haubius pro-
 poses several curious questions here. An omnio-
 Contagio Animala? we cannot admit that they
 are as this has been observed only in a few spe-
 cies of Contagion; besides Contagion may be both
 the cause of the effects in the Nervous system & of
 fermentation in the fluids, as also of the production
 of the small microscopic Animals observed, nor
 are we to infer hence that such Animals are
 the cause of all these effects. With regard to the
 next question we cannot conceive that the Imagi-
 nation can have any effect on the fermentation
 of the fluids. We however find of this kind only
 show that Fear is a very strong concurrent cause
 in Contagion. With regard to the Libellulæ we
 see them act uniformly & loudly but cannot
 therefore suppose them of the same nature.
 The an Anidæ to particular Contagi-
 on may not be impossible, yet it seems equal-
 ly improbable with the Philosofer's Stone. How
 Contagion propagates itself is a Mystery, but
 this is in common to all. Term. Haubius is
 puzzled to find out why these Ferments act upon

on the living body. We may attribute it to our fluids suffering some considerable modifications from the states of the vital principle. Another question should be taken notice of here. If contagion acts as a ferment on the fluids there after once undergoing this process will not suffer it again. This is easily explained in fluids ^{out} of the body; but the fluids in our body are so oft changed that we might expect them capable of undergoing the same fermentation with those before them. May we impute it to Impressions on the Nervous power becoming weaker & weaker till at last they are none at all. The fact is undoubted, but persons are attacked with the Plague more than once. Shall we say then that the plague has of the same general appearance has particular modifications at each time it returns so as not to contradict the general position.

As to what follows our time will only permit us to select those particulars in which Gaubius is to be reprehended. The operations of the mind may be considered as simply intellectual, or as attended with volition. This gives the two divisions of Gaubius. With regard to the operations of the
intellects

intellects. It is probable that the Soul in thinking is under actual motion of its material parts. But thinking is undoubtedly connected with the material part, nor is any separate independant action of the Soul to be omitted. The motions of the Sensorium in thinking have their proper measure. If the motion is excessive it may have several pernicious effects on the System. Dr. Gaubius goes further in pointing out what these effects are, but he uses a number of loose terms & several hypotheses which cannot be admitted. The whole is that excess of motion in the Sensorium weakens its own power and so that of the whole System. Gaubius adds, properly that these motions prove a Stimulus to the languid System: further, that when the Mind acts intensely Muscular motion ceases in proportion to which the Lethargium morbi is to be imputed.

The 3^d fact is that variety of Studies renders excessive study more tolerable. We may easily conceive that the action of any one part for a long time will affect the Sensorium much more than when alternately different parts are used. Further Application of one single object must be hurtful, because attention to that has the effect of restraining the
 nervous

Nervous influx into other parts. Thinking is a Stimulus to the System, and so it might be supposed that the want of this will occasion the System to languish; but no such thing seems to prevail in fact, the reason is that Muscular motion is sufficient to preserve the powers of the System in a proper state, or that the external impressions are sufficient to prevent the System from languishing.

We now proceed to the

Vis Noxia Animi Perturbationum.

Here the effects are more evident. To give a System on this subject. The Passions may be considered in two views, first as they are agreeable & pleasant, or disagreeable and painful. The agreeable & pleasant are always Stimulant, the disagreeable & painful are always Sedative. But the Passions may also be considered as actual or restraining from action; those leading to action are properly Stimulant, the others manifestly Sedative: their objects are variously modified according to their degrees. Again, few of our passions can be considered in this simple view, most of them are very complicate. Love is sometimes full of Hope and Confidence, sometimes of despair and jealousy. They are also very complicate if considered as actual or restraining from action. Thus fear may drive

different effects, a coward obliged to fight is a very dangerous enemy. These are the foundations on which we are to judge of the effects of the passions; further whilst the passions are Stimulant or Sedative to the whole System they have oft a particular relation to various parts. This might induce a Discussion of Physiognomy and some other particulars, but we are restrained by time.

We come now to speak of the

Excessus Somni et Vigiliarum.

The Exercise of the mind and body have their stated measure not only with respect to degree but also to duration. Excess of either of them must be hurtful to the Stomach. The same principles apply to the excess of duration as that of degree, excess of waking overstrains the muscles employed to keep the body erect, overstrains the Sensorium, occasions waste of fluids & so increases the Acrimony of the remainder &c. Excess of sleep induces a Torpor of the Nervous System, by diminishing the action of the solids on the fluids it prevents their motion and increases the Laxity of the Solids, it diminishes the Secretions &c. &c. A question occurs here about the time of sleeping & waking; all times are not equally fitted for these purposes. The very best

of Animals in the night gives silence, together with the darkness, & the cold of the night air too admixes us to sleep then. But further the heavenly revolutions have some effect in producing an analogous revolution in our system. We have always an accession of Heat and quickened pulse soon after noon & another soon after midnight, but this is not confirmed by a sufficient number of facts to prove that this cannot be connected by habit. It appears however that the sun has very great influence on us. The body then should be at rest in order not to be irritated at this time of heat which is greatest soon after midnight. Those who keep late hours tho' they take an equal proportion of sleep never have so hale & healthy a look as those who keep earlier hours.

We go on now to the

Excretio et Retentio Inordinata.

We have before spoke of the effects of an undue balance in general, what remains to be considered here is when the Excretion or Retention are faulty with respect to any particular fluid. These however rather belong to the Actions Loco and come under the head of symptoms rather than of causes. I shall only give you a few cursory remarks.

117

With regard to the Saliva it is known to be necessary to the Assimilation of our food. This Assimilation then will be imperfect if the Saliva is diverted to another course; accordingly when the Saliva is thrown away the Marks of Indigestion appear & particularly of Acidity.

The want of a small quantity of Acidity can not affect our Mass of fluids as supposed by Gaultier. He considers Costiveness in the view of hardened Faeces solely, but this do not exhaust the whole effects of Alvine Constriction & Tarda, the latter brought on induces a Torpor in the Peristaltic motion of the intestines, and this is propagated to the Stomach, hence this has so considerable a share in all the Symptoms of the Hypochondriasis. He next considers the effects of the interrupted excretion of Urine and of its accumulation in the bladder; he should have added to this the accumulation in the Ureters and Kidneys. The effects are such as flow from its passing out by other passages or inundating other parts particularly the Brain without the least marks of Acrimony. On the subject of perspiration he is very short. Its effects are chiefly to be confined to the Excrement or to the diminution of the quantity. The effects are here

those of the quantity and quality, those ascribed to the heat are difficult to be conceived. Some of the symptoms ascribed to increased perspiration as *Animi deliquium*, *Morbus Subulana* &c. seem not to be well founded, sweating has the same effects but in a higher degree. The altitude of persons to catch cold during sweating may be imputed to increased sensibility by the heat. When the balance is thrown very considerably on the external parts, as by sweating, a sudden check to the vice, has more considerable effects. The effects of the *Immodicum Veniens* & *Profundum* are not on a proper feeling in habits and not imputed to the external part, but to the humours. The fullness or emptiness of the vessels coming to have more great effects on the one or the other of the system, its opposite, the *Arteriole* & *Venae* is a very rare occurrence in the Arteries. I have seen instances of *Sanguis* & *lymphomania*, but these occurred in women rather as related to the other extremes. The effects of the *Locustae* effects are to be attributed merely to the quantity, if it has any effects on the *Vitæ Venosa*, must be by affecting the *Serion*, the proportion of usual exhalations formerly explained

as producing Mithra. Its opposite will come 169.
more properly under the head of blood letting.
What next follows on Calculi (concretions) we
shall endeavour to speak of more systematically.

De Calculi Origine et Acumentis.

Calculus concretions can scarcely be supposed
to be collections of matters before dissolved in
our fluids; most probably it is a separation of
matters before dissolved. With regard to diffusion
even in the prima via we may observe that dif-
fused matters are less apt to form solid concres-
cences & rather fall down in a loose sandy
form. This must be the case in the prima
via appears from the quantity of dissolved
matters which must necessarily be in them;
this will easily appear from the quantity of
of dust taken in, yet concretions are never
made there; ^{these concretions are common, for nucleis} but farther ^{there}, and such are common-
ly from solution. We set out then with this
proposition that they were before dissolved in
the fluids. Dr Gaubius finding them to be cal-
led earthy concretions & insoluble in water after
their separation is at some pains here to obviate
this prejudice. He gives many similar in-
stances.

(a) If we would apply to the Absorbent System any thing like an Elective Attraction, as seems very likely to take place, they might be admitted.

stances in natural history. It is then strictly dissolved matter, how is this separated? The most considerable means of separating dissolved bodies from their Menstrua is by cooling the mixture. By restoring the heat of the Wine we can make it dissolve again in the sediment it before deposited; but neither the cause and therefore not the effect can exist within the body so as to account for such depositions. 2^d Dissolved bodies may be separated from their Menstrua by Evaporation. Nothing of this kind can strictly take place in our body. But Exhalation abstracts the fluid parts and must therefore either be supposed to separate dissolved matter or to have some effect in the way of Evaporation. Another way of separating dissolved bodies is by abstraction of Air from the mixture; in like manner addition of Air in some case occasions precipitation; both of these may take place in our bodies but we know nothing about it. A fourth means is by precipitation or elective attraction. The attraction of adhesion seems sufficient here to occasion precipitation, thus the application of certain dry & solid substances, not even such as absorb the dissolved matters, seem to give occasion to precipitation. This seems

seems to take place in the Urine particularly. Any extraneous matter getting into the bladder becomes a Nucleus to which the saline parts of the Urine adhere. This is the chief means of increasing Urinary Concretions and will account for many of them; but in most concretions we must still look for some other cause. 1st We may conceive that any part of the Inner surface of the urinary passages may become dry, and in this state it will answer the same end with the extraneous body just mentioned. In an analogous instance to this in the dryness of the blood vessels occasioning Catarrhus, so Inflammation of the Kidneys may occasion a concretion which will lay the foundation of larger ones. But are there not other causes besides these? These commonly supposed are not touched on yet. Let us suppose the Urine to become a supersaturated solution, suspending the whole during motion but letting it fall on rest; this is what is almost constantly supposed by Dr. Haubner. But there is a considerable difficulty in this, for we know no similar instance in the history of a solution not supersaturated depositing its contents on rest; but in the blood we suppose the coagulable Lymph to be dissolved in the serum, a part however is only diffused, and on rest this is deposited. But

admirable

These Cases may either be 1st a particular state of the Mass of fluids producing a large quantity of the Matter thus to be passed off by the Urine, or 2^d a particular state of the Kidneys whereby they are more disposed to wash off this matter. That this Supersaturation takes place in the Blood is scarcely to be admitted for the reasons here offered.

admitting the possibility of this case it would be
 more difficult to assign its causes. These will either
 be the secretion of a large proportion of the matter
 to be suspended in the Urine or the greater aptitude
 of the Kidneys to wash this matter off. The first is
 possible, but we don't know when it happens or
 from what source. It doth not depend on any par-
 ticular Aliment, the subject Dr Haller's observations
 that calculi are most frequent in England, Poland,
 & France, and imputes this entirely to the greater
 number of operators in those countries; but the cal-
 culus diathesis happens even in persons of temper
 who never showed any such disposition themselves;
 it is not more frequent either in the colder countries
 of England or on the borders of the Rhine. If from
 supersaturation, we should expect them more fre-
 quent in different parts of the body; a combination
 of calculi in different parts is a very rare occurrence.
 It doth not depend then on supersaturation in the
 blood vessels; but supposing calculus diathesis to be
 owing to the fluids it is very difficult to say
 whence or when it arises. Gaubius talks of a *tertium principium*, but we neither know the fact nor
 can conceive its effects; much however has been
 said of Insoluble Earths and petrifying waters
 accordingly.

accordingly they are carefully avoided, but this is a remarkable fact that undoubtedly these petrifying waters give relief in calculus concretions, and are really Lithontriptics: the reason is from their Absorption of Acid. But Dr. Gaubius is obliged to have recourse to another matter Acidum in terra desiccum, but all this is imaginary. we have a Symplic Composition of Acid and Earth, viz. Ullum, but there is no proof of any such prevailing in our system. Dr. Gaubius always hints at this which is a mistake that Earthy salts are more liable to separate from their menstrua than any others. This cannot agree in the least degree to any accept Selenites. That this is present in the waters we take in there is no proof that this is taken in in a super-saturated state which yet is necessary to produce calculus concretions in the body. Various causes of the precipitation of these Saline matters in the bowels of the Earth, but as these cannot be transferred to the body it is probable that calculus concretions don't depend on these m. ^{supplied by Dr. Gaubius.} The greater part of the remedies employed to cure these Concretions are ^{are} Absorbents of Acids. But yet there is no proof that these act by decomposing the Stone, & their operation is quite a mystery.

It is time now to take notice of the 2^d Subposition, that
 Concretions

Concretions may depend not on the state of the Blood but a particular condition of the Kidneys. It seems pretty certain that there are constitutions which will form a stone out of any Urine or blood. This is probably owing to the affection of a particular part, since we seldom find combinations of Calculous Concretions in different places in the same person. It is true that this particular affection may depend on a general state of the system. The gout is a disease of the joints but still has a particular connection with a certain condition of the system. The same may be supposed of these concretions, and more especially as they are very intimately connected with the gout. This then appears to be the most frequent cause in calculi, and it is this we are to enquire into to account for their generation. We must be satisfied with having brought the matter to this point, I shall observe only that it will always be dubious whether the remote causes do so as to furnish the calculous matter; or only act on the calculous diathesis. I know an instance of a Gouty person who on taking a little vinegar into his Stomach is seized with a Gouty Paroxysm. This will make us every difficult of admitting that Dooseen's furnish the calculous gouty matter. There is no such instance of a supersaturated solution as above

a lower sphere of except in the blood. The matters diffused here must in several cases pass off in this undissolved state in consequence of increased impetus, debilitation &c. If there are follicles in the secretories it may stagnate there, and give occasion to concretions. This indeed is Hypothetical, but Dr. Hunter will scarcely allow it to be such, and produces several facts in support of it. There may be such an inflammatory state of the Kidneys as carries off this undissolved irregular lymph which may afterwards be retained in some part of the urinary secretories and occasion calculi.

After this Hypothesis given on calculous concretions we proceed to the

Potentio Morbifica Animato of Gaubius. He does not consider this in an enlarged view with regard to contagions, but confines it almost solely to the case of Mordms. The origin of these is still so much disputed, and their effects so difficult to explain that we shall pass over this subject altogether.

The next and last head of Potentio Nocens is too obvious to need explanation.

We come next to the **Seminia of Gaubius.** A discussion of this point would take up too much of our time, and these seminia act rather in

inducing Predisposing causes, of which we have already spoken, than diseases. The three Natural Medicatrices has been sufficiently spoke of.

We come now therefore to consider that part, treating of symptoms. Every change in the state of the body observable by Physician or Patient becomes or permanent is what constitutes a disease. It seldom happens that the body is not changed in more than one part at the same time, the whole then is called the disease, the particulars the symptoms. There is nothing of more consequence in Physic than to discern the Species & degrees of these symptoms, and particularly their concurrence. The next thing to be wished is to assign them proper fixed terms generally allowed by all. For these 100 years past we have been much engaged in arranging the productions of nature which has been chiefly done by deleting their particular appearances and assigning them fixed terms. Until we have a proper *Deliniatio morbi* in imitation of the *Deliniatio naturae* we use shades never have a perfect *Nosologia Methodica*. When this is done it remains to adapt certain method of cure to each species. We are here

upon a Dogmatic plan to mark the chief appearances in diseases, and to trace these up to the *Causa Proxima*. Oft in tracing the *Ratio Symptomatum* we come only to the last *Step* of the Series of causes and effects constituting the *Causa Proxima*. This *Ratio Symptomatum* is not always to be obtained tho' frequently it is; but even when not to be obtained such an enquiry is of the greatest service since it leads to the Investigation of the Species, degrees & concurrence of the Symptoms and the *Remota* causes. It will bring out too several facts, for it must be observed that the chief facts in physic have been derived from Theoretical discussions. Gaubius divides this part into 3 heads. This division is by no means a good one to himself gives up the *Secretorum vitia*. The *Qualitates sensibiles alienatae* might also be referred to the *actiones lesae*; but this would not be admitted without some dispute: we shall therefore consider them separately; they are such as cannot properly be referred to either of the other heads. There would the enumeration above spoke of be difficult and the *Ratio Symptomatum* principally fails. We shall consider only some of the chief, and first the change

Change of Colour.

This is very obvious & if it could be properly explained would be of great use. Colour is first of the Solids and particularly the Cuticle; this differs much in different Climates and different persons. The theory of colours is little known so this must be a mystery. The original colour & density of the Solid with that of the transmuting forms the natural colour of the body. We can account for several changes of colour; thus 1st it may depend on the Solids, or 2^d on the fluids. It may depend besides on the greater or less quantity of fluids, on fluids passing into & out of the body not their own; we would admit the Error Loci so far, as also the Error adjuvum. To mark now the chief changes of colour that do happen, and to show their connection with those causes.

The whiteness of the Skin may be owing to the vessels not being properly filled. This may be owing to Cold preventing the proper entrance of the fluids into the vessels or the action of Astringents. A diminished impulse of the heart and Arteries will have the same effects, further Paleness may be owing to the fluids having now a smaller proportion of red globules; lastly, Paleness may arise from

from paler fluids mixed under the surface of the body as in Erythematous swellings. The redness of the colour may be increased, first, by the increased action of the heart and arteries. The change is still more remarkable when vessels not before red now get red globules transmitted thru them. This is still greater when the impulse is directed to a particular part as in the flushing of the cheeks. Redness in particular parts will be increased by effusion of red blood under the surface. It is disputed whether the colour in Inflammation is owing to the first of these causes only or also to the last. Dissections show that this last sometimes takes place, but it is difficult to say when it does. I suspect that those Inflamm^d tumors where much red blood is effused are most apt to turn to gangrene; the fullness and deepness of the red blood will mark such effusion. This red colour frequently assumes a blue, purplish, or even blackish colour. The blue colour is the natural one of the veins. An enlargement of the vein then increases the blue purplish colour. If the blood is effused from the Arteries into the laxer cellular Membrane it will assume nearly the same colour as in the veins, hence the colour of Ecchymosis. The skin appears black from

from external causes. The leaden colour is a mixture of these darker colours with paleness. This is frequently owing to obstructions in the veins, arising perhaps from a weakened Impulse of the Arteries. The Liver in Gangrene may also be steep towards the black colour appearing in mortifications. There is also a yellowness oft observed in the skin. This may be owing either to the Bile or to Serum changed in its colour. The different colours of Serum is difficult to account for. It is attributed to its Alcaliscenty & probable that actual putrefaction gives it the green colour. It is difficult to say when Yellowness is owing to Bile; that the Serum may be thus changed should appear from hence that a yellowness has been observed in one half of the body. The yellow colour then in many instances is owing to Serum either appearing first in the vessels or effused. The concurring circumstances of distension of the Lungs must also be taken into account, thus we find it in the case of Pleurisy spreading from the part first affected. The green colour is frequently owing to a mixture of the yellow with blue. The Ecchymosis is at first a black colour from the quantity of Red blood poured out; afterwards a part of the red Globules being perhaps absorbed a yellow

low or green colour succeeds.

We are now to observe the frequent changes of Colour as alternates redness & paleness. This is a mark of the Nervous power being affected & it seems to imply a muscular power acting on the small vessels. —

Dr Gaubius next considers the Odours of the body, but has done this very imperfectly. Indeed we have never been able yet to reduce Idioms to general heads. In the state of Odours there are great changes, the causes of which are out of the reach of our conjecture. — Passing over this we come to the Heat of the Body which we can better trace to its causes. We omitted this in the Physiology, and so shall supply it here very briefly.

We must enquire into the Cause of Animal heat. The Nature of the generating power within us is much disputed nor do we know any probable Theory on the subject. With regard to the generation of heat in bodies we can observe that it is connected with an increase of motion in the parts of the body. There are two kinds of motion observed in other bodies and seem to take place in Animals too. One is Mechanical Motion depending on impulse, the other is intestine motion arising without external impulse.

Impulses in the parts of bodies. This part is of two kinds, one that takes place in muscles, and it is probable that every mixture generates heat. This has never been transferred to the Animal body both because this heat is not durable, and that we know no mixture regularly carried on in the Animal body & in such proportion as to answer the purposes here required. Another kind of intestinal motion is that accompanying fermentation. There are less momentary and frequently during the whole process are generating heat. The fermentations in the Animal body may easily be supposed to subsist like they receive a fresh supply of matter. This has been frequently supposed as a cause of animal heat. As fermentation is observed to be going on in Animal bodies towards Putrefaction, & this in other bodies is attended with heat. It is true that the Putrefaction in vegetables generates heat so as even to excite Inflammation, but several Physiologists have supposed this confined to vegetables and no longer to show that the same takes place in Animals. Even in the immense bulk of a Whale putrifying on the shore it is alledged that no great increase of heat takes place. Yet we must own that there appears

appears of heat in Animals too, but not like they arrive at nearly the last state of Putrefaction.

The Putrefaction too must be hurried on very fast and in large masses of matter; none of these circumstances happen in the Animal body. In dead bodies where putrefaction goes on to a much greater degree scarcely any sensible increase of heat is found. If we are right too in our notions of Ferment we must add too this as an instance where the putrefaction is going on without increase of heat. In the most violent putrid fevers too it has been observed that the heat of the body was diminished tho' this was disputed; further, increased heat, will be attended with increase of motion; but increased motion hastens putrefaction is not known except by increasing heat. In Inflammatory and putrid fevers the heat is rather in proportion to the increase of motion than of putrefaction. From all these considerations the doctrine of Putrefaction is now almost entirely lost. Almost all Physicians have recourse to Mechanical Motions. This has been supposed to operate in two different ways either by the motion of the particles of blood on each other to which we know no analogous instance in

in nature except perhaps in churning of Milk;
 but this is rather to be attributed to the fermenta-
 tion going on than mechanical agitation. Dr.
 Haller asserts that water heats on motion, but
 has no authority for this. The other more received
 notion is attributing Animal heat to the motions
 of the blood on the sides of the vessels. We have
 no analogy in nature to support this; two instan-
 ces are alledged, one of a Canon bullet which car-
 ried for miles has still a great degree of heat
 which has been supposed to be owing to heat
 generated during its motion thro' the air; but we
 know other sources of heat here. But supposing
 it to receive heat thus this doth not apply to the
 Animal body, for the velocity is so excessive that
 nothing like it can take place in our System —
 The other instance is in the case of Mercury, which
 being agitated in a trial indeed generates heat;
 but a circumstance happens here which has been
 overlooked, a portion is always changed to a
 dry powder, and it is to the attrition of this pow-
 der that the heat generated may be ascribed. This
 then is the attrition of Solids on Solids; but sup-
 posing that the Mercury acts thus whilst fluid
 still this doth not apply, as this is a fluid of
 such

such remarkable density. We know that the interposition of fluids between solids otherwise disposed to generate heat on attrition prevents this from taking place which is a strong objection to this doctrine. It is the same if we descend more minutely and have recourse to the particles of bodies returning the oscillations. It is necessary too that there should be an inequality of surface whereas our fluids are applied to a most polished surface. Further our red globules are not applied to dry surfaces, viz. the inner surfaces of the vessels being defended by humid secretions. Even in the supposition of Douglas concerning the attrition in capillaries the want of velocity here is an unsurmountable objection. But further this theory does not solve the phenomenon of animal heat. One is the equality of heat in different parts; to account for this Dr. Martin has shown great ingenuity in endeavouring to show in like manner equality of attrition. He attempts to prove that the surfaces and velocity taken together are always equal; but this fundamental hypothesis of his is without foundation. If we take two broad rules of wood, apply them by their edges and rub them

them on each other with great velocity, great
 heat will be generated. If we take these together
 and apply them by their broad surfaces together,
 diminishing ~~the~~ proportionally the velocity of the
 attrition, no heat will be generated. But without
 insisting on this there is not in animal bodies,
 a sufficient velocity of motion to account for the
 generation of heat even in the attrition of the
 solids; but supposing his hypothesis admissible
 his measures are fallacious; may they depend
 on false principles supposing the denariations,
 to be always equal & that every touch diminishes
 as always in an equal ratio, so may conclude
 that the equality of attrition is by no means
 proved. But there seems to be no occasion for
 this to account for equality of heat since this may
 depend on its very sudden distribution; but the
 degree of heat in different animals is not in pro-
 portion to the velocity of the circulation. Further
 the velocity is much greater in an infant than
 an adult whereas the heat is probably the same;
 it is true that in most instances the increase
 of heat attends increase of velocity, but it doth not
 follow that the one is the cause of the other. You
 may

may have the common cause, viz, the increased action of the vessels increasing the Oscillations of the Nervous power in the moving fibres. The equality of heat in different persons whilst the motion is very different can more easily be accounted for on another supposition which we shall now proceed to explain.

We have nothing but conjecture to offer in this subject. Suppose that animal heat depends on the Oscillations of the Nervous power between the Organs of Sensation & the Sensorium, and still more considerably between the Sensorium and moving fibres. This is agreeable to all our notions of heat which may be demonstrated to depend on the Oscillations of a subtile fluid present in all matter.

Besides, the Matter here then appears to be a particular mixture adhering to our medullary fibres. All fluids are non electrics & perhaps connectedly with this are unfit for the generation of heat. All dry bodies in which heat ^{is} generated are electrics. This then confirms our supposition, we are still further confirmed in it from the remarkable effects of heat & cold on the Nervous power, &

Further,

Further if the Other of our Nerves necessarily accompanies the Medullary fibre it will be a determinate matter there, hence it will be the same in Animals of the same species, which accounts for the remarkable equality of heat. That our Nervous power is readily disposed to Oscillations it doth not without external Stimuli. The most common motions in our System are derived from its own actions. This shows the Connection of heat with the Aerial system, and it will account for the equality of heat in different parts if we take in the ready communication of heat from one part to another; hence the velocity of the Circulation has such influence on heat, viz. as this necessarily proves a Stimulus to the action of the vessels, hence we may understand what Gaubius says of the causes of increased heat. The *Nervis Arteris Sanguinis Diathesis* seems absolutely without foundation, nor are oily fluids from motion on each other more liable to generate heat than any other matters. Amongst all these causes only the first and last are to be admitted, and these only so far as they increase the action of the Solids. To add here one or two Observations.

The

The instances of partial heat and cold is better explained on this hypothesis than any other; thus whilst the hands are hotter than other parts this is accounted for from the increased determination to those parts, but if this heat on the Palms is greater than the internal heat it would seem that this was owing to the increased action of the vessels here generating new heat. I do require a different explanation. In this case we perceive the want of that oscillation which usually takes place in the tremores fibriles; further we have ascertained that with regard to this internal heat, the generating power is increased in order to keep up a balance with the external. viz. Tho' we find sources of heat from external bodies colder than our internal heat yet the heat on the surface is not increased but by bodies at least as hot as our internal system.

The only remaining of Qualitates Sensibiles here is the Magnitudo. Scuta. Dr. Gubius has pointed out all the causes of this, but without giving a proper Arrangement, we have therefore thrown the whole into a Table in order to show the whole in one point of view. Her business here is to consider

190.
Tumors as connected with causes, and this we
have done here. We might have made two ge-
neral heads, 1st of Increased Solids, 2^d of Accumu-
lated fluids, but thought this of ours more clear.
On extraneous bodies we have not ventured on
any subdivision, perhaps the chief of these are
such as are generated in the body itself, the worms
and calculi. A particular Animal has lately been
pointed out of such a structure that it by Absorption
of fluids it can expand itself to a very consider-
able bulk, it is probable that this gives the Tu-
mor called Hydatids. In the (Prolapsus we have)
not in fact a Magnitudo acuta always, but we
have an increase of size in a part where it was
not before. The 2^d head prevented our making
the division to consist of two general heads. We
have rather mentioned a few instances by way
of Illustration than given the whole of them. Under
Sarcoma we include all increase of the soft parts,
this is a very general title comprehending a variety
of Tumors. Sometimes it may be an organized
increase, sometimes nothing besides cellular mem-
brane. The Condyloma is properly the induration
or calluses formed on the surface of the body. A
Verruca

Utricula has been confounded both with the
Condyloma and *Sarcoma*. The white swelling
 is rather a *fungus articuli*, as *Reemars* has
 observed, than a *Dropsy* of the Joint as *Sauvages*
thinks, and therefore properly comes in here.
 In the 5.th head it is necessary to explain why we
 here subjoin the term *maris*. This is of two kinds
 either *Moles* or what are called *Flesh marks*, which
 manifestly are depending on an increase of ves-
 sels, we therefore gave it a place here. The *Hy-*
draxis *Sauvages* means only distention of the lym-
 phatics. In the next head we have placed *An-*
thrax, tho' it rather comes under the 7.th head. In
 order to show the mixture of these we have em-
 ployed the term *Ecchymosis* in a more limited
 sense than *haemorrh*, confining it to effusion of
 blood. *Petechie* have been considered as a spe-
 cies of *ecanthemata*, but if they are such they
 are not confined to any particular duration or
 time like the other *ecanthemata*. The *marisc*
 are undoubtedly very often effusions of blood
 into cellular membrane and not always simple
marisc.—

We have divided the head of fluids effused
 according to the nature of the fluid. The *Serum*
 is

is further distinguished according as it is, changed in its nature or not. When not unchanged it differs in the places in which it is effused. The Hygrama is the Synonym: of the Hydras auctorum. Authors have not distinguished properly between Edema and Anasarca; thus in Edema which is purely topical independent of any general affection of the System, that Anasarca which depends on a general affection. Ascites is sometimes used by Authors for water collected in any cavity even in the cellular membrane, when the water is accumulated in any particular part of it, but commonly it is confined to the accumulation of water in the abdomen. Perhaps the Hydras should come in here, but do not assume it under the general word. — The 2^d head of Serum is where it is effused in a condition to be converted into Pus. whether it is always thus or only when it is disposed to exist as a part of coagulable Lymph as is perhaps more probable.

We have next mentioned Air tho' with what propriety is not certain, yet in cases of Air getting into wounds and swelling up the whole body such as,

an Effusion of Air seems to take place. Whether 193.
the rupture of Aerial membranes may cause
Empyema is not certain; but added Symptoma-
tis here tho' in a particular sense, understanding
by it the effusion of Air into any of the Cavities
of the body. The most common case of Empyematis
is Empyematis Intestinalis which is not properly
an effusion. Next follow the effusions into Cavi-
ties preternaturally formed by diseases. This con-
tains Encysted Tumours which is a difficult sub-
ject. The first division of these is according to the
fluid effused. Under Cystis Ignea all inclosed
dropicks are contained.

Our next term is improprie arising to the injury
in composing the table; the nature of the Chan-
cholle is not very certain. Some place it ~~under~~
in the Thyroid gland, but I have seen it begin
on the right or left side and not in the gland. It
seems rather to be a tumour of the Meatomalous
kind. Of the Gummata I cannot speak with
precision, it has been applied to Nodes & Scrofulas
but is not confined to the bones. Astruc has given
a particular Idea of this matter. The Panthion
is a Tumour in the Membranes & Epidem con-
taining

forming a glaucous matter which may be cut into without danger.

Next follow the effusions on the surface of the skin; of this kind too are excudations in the membranes lining the sides of cavities. We have not yet come to any conclusion about depura, we mean by it here an excudation concreting into a Crust? The proper Senia is confined to excudations from ducts of the Skins as appears from the cure of it. The Achor is what is oft called Crusta Lactea. There are many concretions on the surface resembling this.

Next follows our 7th head. We distinguish this into two heads as they affect the soft or hard parts. The first of these is again divided into that with increased impetus and without that. The first of these is Inflammation which we distinguish according to its seats into Phlegmon, Erysipelas and Rheumatism. The Inflammation of cellular Membrane seems accompanied with effusion of matter apt to form Pus, whereas the Erysipelas is not. The Rheumatism hardly ever terminates in suppuration unless Phlegmone supervenes. We have made several species of Phlegmone not so much from the parts destined to various functions as from their structure. The

The *Tumoreculus* is an Inflammatory Rile, attend-
 ed with effusion of Serum. We should have mentioned
 too the several species of *Erysipelas*, but know not
 how to fit up this plan. We distinguished *Phlegmon*
 and *Erysipelas* from their termination as well as
 their seat, the former admitting of Suppuration
 the latter not; but these two distinctions interfere,
 whence their limits are not properly settled. To Rheu-
 matism we have subjoined the *Neuritis* because
 as an Inflammation it has the same seat; this
 however shall not confound these two together. Next
 follows the *Schirrus* which we make an indolent
 tumor. This term is not used with precision by
 authors, some confining it to Glands others employ-
 ing it more generally as we have done. In the
 conglomerate Glands the affection is more uniform
 arising to some serid matter taken up by the absorb-
 ents and deposited in these. It would be proper to
 mark all these by the general name of *Cubo* whatever
 part they affect. The *Scrophula* is put down here
 as being in all probability an affection of the Lym-
 phatic System. Under the next head we have men-
 tioned as a curiosity the *Parapleuritis*, this has lately
 been spoken of by an Italian Physician as an attendant
 of the true *Neuritis* which leaves a Schirrus behind
 it.

it. With regard to the *Osteosis* we are not certain whether we are right in placing it in the Bones, we rather think with *Du Hamel* that it most frequently arises in the *Periosteum* the layers of which afterwards harden into Bone; but in some cases the tumor is undoubtedly situated in the Bones themselves, this finishes the *magnitudo Aucta*.

We think it proper to pass over the *Lacertorium*, *Vitia* with *Quibus* both because they may be commonly referred to the *Actiones Lese* and that they more properly make a part of the *Semiotics*. For their *Ratio* is not well understood. After these we proceed to the *Actiones Lese*, a Distribution of these is difficult, but the common division answers very well. The first divides them into such as are common for both sexes and such as are peculiar to either. The first we subdivide into *Animal*, *Vital*, and *Naturae*, we cannot enter into a criticism upon these terms. The *Animal* functions are those in which the mind is affected by Impressions made on the body, or again the body is moved in consequence of some changes induced in the mind. The *Vital* functions are those immediately necessary to life. The Actions of the heart & lungs & of the Cerebrum as necessary to these are comprehended under this. The *Naturae*

natural functions are those intended to support the System as the Chylificatives viscera, the system of Nutrition and the various Secretions. There are some questions which may perhaps be referred to more than one of these heads, but still it is not worth while to change this Arrangement.

I shall begin with the Animal or the Organs of Sensation and Motion. There are certain general affections which cannot be easily referred to any particular Organ, viz. Dolor & Anesthetas. I should wish to enter into a full discussion of these matters, but our time will not allow us to enter on it. In these simple perceptions we cannot expect a definition, but as pain is oft used metaphorically it is better to limit its meaning. The before mentioned three degrees of Disagreeable Uneasy & (Painful) this last or bodily pain is what we are here to speak of. On what particular State of the body doth this depend? The causes seem to be all such matters as set the particles of the solid matter of our Nerves at a greater distance from each other or whatever threatens a solution of continuity. Gaubius allows of this, but thinks this doth not exhaust the whole. In the first place we see sharp points or edges are a principal means of producing pain. 2^d All modes of external impulse with a certain degree of force applied

applied lengthen the fibre and therefore set the particles at a greater distance from each other. It is easy to apply this to other Senses. Sight & Sound give pain only under a certain degree of force of Impulse. The same Theory may be admitted with regard to odours if we can distinguish between such and such painful and the others. Those which are painful are only such as are most volatile and therefore act with greater force of Impulse. In the 5th Sense of Taste there is some difficulty. The painfull tastes are the Acids and nothing more common than to suppose that Mechanical and Chemical Acids are similar and act in the same manner. If this is admitted our System is complete. We may observe that the most remarkable Acids are Saline, and since these in concretion so readily admit an angular form this Theory is readily received. (But we have before rejected this Theory and refused the transferring the notion of Mechanical to Chemical Acids. The Doctrine of particles of the Salts being angular is without foundation.

Dr. Hooke was accounted for the Crystallization of water merely on the supposition of its particles being Spherical; further, Sales non agent nisi soluti. Dr. Gaubius tho' he admits this notion in general cannot

cannot reconcile himself perfectly to it. Even Bils
 are as considerable Periods as Salts, and it would
 be difficult to prove that Bils are of a Saline nature.
 Menstrua are not to be considered as acting me-
 chanically, and it is now generally received that
 this depends on Attraction; (because) the *Ordifolies*
Silices we are not to conclude that its particles are
 angular or act as wedges; there is no occasion there-
 fore for us to transfer this to the Animal body -
 Acrimony by its producing Solution of Continuity,
 may be referred to the force of Impulse. But we
 are inclined to go further and suppose that the bu-
 siness of taste depends on the particular Oscillations
 of bodies designed to act on these Organs. This too
 then is referred to the force of Impulse.

There still remains the Impressions of Heat & Cold.
 That Heat acts the particles of all bodies at a great
 or distance is very obvious, but a particular illus-
 tration arises from the case of Heat. Every change
 of temperature from a lower to a higher degree gives a
 Sensation of Heat, tho' this is lower than the internal
 heat; all the sensations of heat however are never
 painful, and that because they never can have the
 effect of expanding the solid matter like they exceed
 the

the internal heat of the system. In Cold we meet with great difficulties as this brings particles nearer together. May we say that a sense of cold is, not the sensation of condensation but of the increased impetus of the blood on these constricted fibres? But we have not yet sufficiently digested our thoughts on this head, and must at present leave this problem. Besides solution of continuity Dr. Gaultius seems to adopt some other causes of pain. What he means by Terror thence we do not perfectly understand. We are averse to admit of these notions as they are rather Romantic and rather refer the Phenomena to the different modes of impulse acting as above mentioned. We may refer pain either to distension, or Spasm chiefly. We may add to this Chemical Acrimony, but this is topical and affects only the extremities of nerves. Dr. Gaultius here starts the notion of Dolor Imaginarius. We don't know the facts in proof of it, and doubt of the doctrine even from the very circumstances adduced by him in proof of it, viz. Dreams and Deliriums. He says that we have the idea of pain without the Sensation of it; but before observed that the Memory cannot renew the idea of pain, viz. as internal affections cannot renew them as they renew only such as before were

were laid up in the memory. An important question is to determine whether pain always arises from Impressions on the Extremities of Nerves or sometimes from Impressions directly made on the Sensorium commune. Dr. Haubius thinks that many Sensations may be renewed by Impressions on the Sensorium commune, and among these pain. Even in Dreams & Delirium Sensations are not to be renewed but by inducing the same state in the extremities of Nerves. With regard to Sight and Sounds can renew Sensations but less perfectly in the last case than in Sight. In the other Senses we don't find that we can recollect or renew Odours or Tastes. We have indeed a reminiscence, so that an Odour being present to us we can remember to have had it presented to us before. If this was attended with any reflex Sensations the bare name of such Odour and Taste will be attended with the same Sensation & Smell. So far it goes and no further. Even in Dreams and Deliriums the Imagination is confined only to the Objects of Sight and Hearing, therefore we refuse that there is any imaginary pain and that this must imply a particular state in the Extremities of the Nerves; the Sensation then of pain whenever it recurs always implies a change in the Extremities of Nerves. Most
other

other changes may consist in a difference of the
 Oscillations solely; but pain seems to consist in
 a change of the state of the solid matter of the Nerve.
 The Mind always refers pain to some particular
 part but is not very accurate in doing this, or
 only with regard to the surface of the Body. Hence
 it is of particular use to direct us to remove the
 hurtful Impression. In other cases we refer the
 pain to the part very grossly as is plain in the
 instance of pain in the Hypochondrium. We talk of
 Rheumatism and Gout as differing in the depth of
 their seat, whereas our sensations give us no
 precision in this respect. Investigating the place
 of pain is very important. — Hence is the place to
 enquire into *Lymphatic* pain, that pain may be
 felt in other parts besides that in which the Im-
 pression is made we acknowledge, but not on
 the common footing. Only in one case do we make
 a false relation to a part, as when the mind has long
 been in the habit of referring pain to an extremity
 of the Nerve on which the Impression was made.
 This is the noted Phenomena attending an Irritabi-
 lity depending on the force of habit. Pains are some-
 times felt not directly in the part in which the Im-
 pression is made but in a different one. First we
 should have observed in speaking of Distension as

a cause of Pain, that this may be from the nervous power passing more copiously, into a particular part, and which may perhaps account for spasm.

In consequence of Oscillations propagated along continued Solids the pain may be felt at a distance from the place of Impression. Another case is when the Oscillation is freely propagated along continuous Membranes which transmitting it freely, are attended with no considerable pain; but in parts, where it is confined it produces pain, hence the cause of pain in Joints. Where parts are insensible to Oscillation the pain may be felt at a distance from the place of the impression, hence the pain in the Glans Penis from a stone in the Bladder. There is a 4th case where a Membrane is only fixed at one extremity, the pain may be propagated along the Membrane to the part where it is more fixed; thus the pain in the shoulder from a Schirrus Liver may be accounted for. These seem to be the only cases of Sympathetic pains in our System.

In many cases an Idea excited in the Sensorium Communis will produce the same state in the Extremities of Nerves with external impressions. This, however is limited not can the Idea of Pain be removed in the Sensorium and therefore cannot remove the state

(a) This seems to be a wise provision of Nature to prevent the fatal effects to the System that would otherwise on many occasions ensue. —

state in the extremity of the nerve. Another thing
to be mentioned here. Pain is produced by various
Impressions, and these modify the sensation of pain
variously. Pains produced in the external surface
have a mode in some measure expressing the mode
of the External Impression; the question is whether
we can transfer this to the internal parts. Dr. Baillie
is disposed to think that we may. This however is
very unsuitable to his former Doctrine of imaginary
Pain. He would allow the fact tho' it is difficult
ly reconciled to some parts of Theory. Dr. Baillie
next proceeds to mention the effects of pain. Pain first
acts as a Stimulus exciting the Nervous Influence into
the part affected as also into the neighbouring parts
and so exciting the impulse of the blood in the
neighbouring vessels. Pain is further to be consider-
ed as an uneasy Sensation of the mind, and in that
view it seems to be a general Stimulus. But we must
limit these Stimulant effects to pain in certain de-
grees, for beyond that it may produce fainting
and if it was not for that would frequently induce
Death. Further when pain is continued long in any
one part, as if it was accompanied with over distension,
the parts don't recover their former tone, but become
flaccid. This view extricates the matter from the

Anxiety seems to be nothing else but a difficulty of performing our Intellectual Operations.

confusion in which it seems to lie in Haubius. The
pain is not always suitable to the m

but it is to the force of the Impression and the sen-
sibility of the part and person affected. If a man has
been shut up in the dark for some time a moderate
degree of light will affect him much from the sen-
sibility his Eyes have acquired. There may be con-
ditions giving a Sensibility to a part so as to occasion
a Sensation of pain at one time from the same Im-
pressions, which don't at all another. This will explain
some matters of dispute between Dr. Haller and his
adversaries.

We come now to the head of **Anxietas**, which
we interpret by the name of Sickness. This however
is synonymous to Disease, and must therefore be of
great extent in Pathology. As a simple perception it
cannot be defined. It undoubtedly arises from Inter-
nal Impressions which we don't always directly
perceive and don't refer to the part affected. We fol-
low Haubius in first considering it as belonging
to the Mind. It is therefore an undecy propensity to
remove a present or prevent an impending harm, or
it is an uneasiness arising from the want of a
certain object the means of which we want.
Then I say again truly, this is not to be considered
as a disease since it both not arise from rebury
in

in the state of the parts, but if a person estimated these fears much higher than they are in fact, this is a morbid anxiety arising from a change in the state of the Corporeal System. Anxiety is very apt to induce Pusillanimity. To trace the changes of the body.

When joined with inconsistency it is then a part of delirium and may be imputed to causes acting directly on the Sensorium. Again, when an imaginary Fear is single and not attended with other inconsistency, and particularly when no bodily symptoms occur then this makes the true Melancholia which seems to depend on a more partial affection of the Sensorium; but when this is attended with morbid symptoms in other parts and particularly the Alimentary Canal, this gives the Melancholia Sympochondriaca; this then depends on a different state in the extremities of nerves. Scabrous skins a very general cause here, Resistance to secretions of all kinds. Some of the various species here introduced seem without foundation, others however are very proper. It is to be doubted here whether all these Maximine Secretoria may be supposed directly to produce this Sensation of uneasiness, or rather some of them don't produce others more apparent

apparent causes of Anxiety.)

Such for instance is a difficult transmission of blood thro' the lungs giving difficult respiration. Another cause of Anxiety is a Sense of Resistance to the transmission of blood thro' the heart; these are oft combined but sometimes separate. A 3^d cause of Anxiety is a difficult transmission of blood thro' the Abdominal viscera; we are not sensible of this as of the other two and rather infer it. A 4th head ought to be marked out and which seems omitted by Gaubius, this is that a Sense of Anxiety very commonly depends on the state of the Stomach. This seems to be the cause to which the term Sick-ness or Anxiety is most strictly applied. This Sensation joins itself so frequently to the other that oft it may be doubted whether this is not the primary cause, and whether the others may not act in inducing this. In the first place this may be brought in by various matters thrown into the Stomach, as be all those matters which at last bring on vomiting. It seems to be then that state of the Stomach immediately preceding vomiting. Dr. Gaubius in treating of vomiting mentions the various remote causes of it, but nowhere touches the proximate cause of it which must

must be this very state we are enquiring into. It is reckoned sufficient to say that it depends on stimulus, but this instead of increasing the Peristaltic motion stops it or determines it upwards by constricting and elevating the Diaphragm. This is attended at first with Anxiety after wards with vomiting. It is not therefore the Stimulus of the Stomach, that produces the action of vomiting, but it produces this state of the Stomach which is the proximate cause of vomiting. We find also the same effects brought on by causes not directly applied to the Stomach. This state of the Stomach is connected with various other parts of the body and this is accounted for by sympathy on which we have before spoken. It is necessary here to enquire how these different sympathies can induce this state of the Stomach which induces anxiety. This subject we have before handled, and shall therefore proceed now to the next part of Gallicus.

The *Actiones Sensuum Externorum* Lesiones must be omitted for the same reason here as in Physiology, and so we proceed to the

Sensuum Internorum Lesiones.

All these may be referred to Delirium. Concerning this we have to mark its general nature, its degrees

and various causes. Delirium consists in a train of Ideas not connected by or properly contrary to their usual relation; but it may also consist in false conclusions from impressions that do not exist or don't then act on us, therefore it very oft consists in this that either real or imaginary Impressions excite the passions of Fear or Anger in a degree far beyond their proper force. From these views there is some foundation laid for distinguishing different species of delirium. There may be another foundation from its different causes. It is but seldom separated in fact into these different species and more commonly it differs in degrees; when it comes on by degrees it comes on usually first with an impaired recollection with a difficulty transition of our Ideas; this gradually increases to an involuntary train, but this without inconstancies. It then proceeds to the irregular transitions in which it chiefly consists. At this entrance there is commonly the case of false Imagination added, and this induces those violent, restless and gives the highest degree of Delirium. It may be observed that Delirium commonly begins with Dreams which seem to arise from the same cause but in an inferior degree, or with a state between

Sleeping and waking. The application of all this, especially in fevers is very obvious.

To enquire now into the causes of Delirium. It is unnecessary to premise with Gaubius that it is in part corporeal tho' not entirely and only so far as it is so can we enquire into its causes. Nothing more absurd than the Stahlian doctrine about the independant actions of the mind. We shall refer the causes to 3 general heads which are

1. Internal Impressions having the effect of external, and so either interrupting the ordinary train or mixing themselves with it and thereby, producing circumstances. Such is increased impulse of the blood in the brain or particularly in some organ of sense as those of seeing and hearing whose Ideas are capable of being removed. A curious case of this was a Lady who was particularly affected with the images of hobgoblins before her which gave her a disturbed mind. Her Physician was present when she was thus seized and endeavoured to lay his hands on her Eyes, but he only covered one and yet the Hobgoblins disappeared; on repeating the Experiment and covering up this eye the Lady was cured of the false Imaginations which shows that they depended entirely on some fault of that eye.

But further, pain and anxiety from various, causes serves on many occasions to cause Incoherence in the train of thinking; this is very evident from the effects of uneasy postures in producing dreams. To this head it belongs to observe that if we have not the command of our attention any new impression will interrupt and disturb the ordinary train of thinking. There is an instance of a person whose delirium was highly increased by having his bed placed in a different part of the room and was cured by replacing it.

2. Interrupted Communication between several parts of the sensorium may occasion delirium. The affair of Memory seems to depend on a particular corporeal Organ in the brain. Dissection however in many cases doth not discover any of these Organical affections. Dr Gaubius's arrangement here would afford room for criticism, but our time doth not permit.

3. A resistance to the Influence of the Nervous Power arising from the State of the Nerves themselves or from causes acting on their Extremities. We deduce this from hence that we explained sleep to arise chiefly from such a resistance, need we

to add that many causes of Stoop act on being applied to the extremities of Nerves, as Cold & Opium. Delirium thus distinguished by its causes is treated on 2 different Indications. The first is to diminish the increased Impetus and chiefly by blood letting. The 2^d is to restore the communication, this is very difficult and scarcely to be attempted. The 3^d is to overcome that resistance to the nervous power which contrary to the first is apt to be done by Stimuli. Writers answer this and both is taking off Spasms from the Surface and as Stimulants, this demands our attention the management of delirium in advanced state of fever being very difficult.

We proceed next to consider the affections of motion. These equally apply to all the motions belonging to the several functions. We here consider motion as confined to the Muscular fibres and in this review as offending in excess or defect. To these Gaubius applies the terms Spasm and Palsy. The first of these is not used with precision it confounding proper Spasm with motu convulsiva. These are different species of the same genus. The ambiguity that has occurred in authors is not without some foundation. In the first place they seems

seem to differ only in degree, and spasm to be
 only an increased degree of contraction; They have
 often too the same causes, still however they are
 carefully to be distinguished since their effects
 are very different. Convulsion increases the action
 and all the effects of contraction, Spasm stops both.
 It were to be wished that the different states of the
 muscles under them could be explained. Convulsi-
 on evidently depends on a greater influx of the
 nervous power, so both Spasm, but why it goes
 farther and is not disposed to remit depends on par-
 ticular organization of the muscle with which we
 are unacquainted. Several curious questions occur
 hence. Doth Spasm occur in the heart? I am convin-
 ce that it doth. I knew a gentleman subject to
 frequent faintings more from exercise than Inani-
 tion; he died in one of these, and on being opened
 nothing like Polypia or Spasmodism was found, whence
 we suppose that the heart is liable to spasm. Is
 Spasm of different degrees? I am convinced that
 there is and that several parts labour under a
 greater degree of Tonic power but not going so far
 as Spasm.

Next we are to consider the causes of Spasm.
 We

we ascribe it to an increased influx of nervous power into muscular fibres. But we are to consider whether this is always derived from the Sensation or is in consequence of Stimuli applied to nerves in their course, or also whether something doth not depend here on the state of the muscle. In the ordinary case of Tremor it seems to depend on Atonia of the muscles rather than on any fault in the influx of the nervous power.

Another consideration on this subject is that it is very common to refer the whole to Irritability or Stimuli or some impression that is the cause of Increased influx. But this is not always the case and it is oft entirely owing to increased Mobility. This is the proper Irritability of Dr. Quibus. Thirdly, supposing no peculiar mobility in the whole System or particular parts there are some causes acting on the Sensorium alone others on the Muscular Organs, a 3^d set on the Nerves in their course. It is very difficult to refer the causes of excessive motion as Irritaments to general heads, it must however be attempted. In the first place all Impressions of a great degree of force not only produce their proper motions with some velocity and force, but also the same sort of motions

in the whole of the System. I would separate from these Impressions not acting as Stimuli, but by acting on the Sensorium produce a reaction of that as told, &c. Among the rest we may reckon whatever considerably weakens the 'Sonic' power of the System; then whatever weakens the action of the heart, greatly and suddenly, as fainting, &c. &c. &c. &c. is very apt to induce Spasm and Convulsion. In the next place from whatever cause all strong and long continued efforts tend to produce Spasm and Convulsion; still more remarkably also hurried efforts have this effect, more particularly they do this as attended with violent passions and emotions. The Nervous System is to be considered as equally balanced; to this purpose it is to be observed that many causes acting seemingly equally on the whole Sensorium affect one side of the body only. This points out that the two Hemispheres of the brain counterbalance each other so that the want of a proper Equilibrium between them directs the impression to a particular side; but habit will oft throw the balance too much on one side, and therefore will give occasion to this effect. We must add to all this one special cause of convulsion. Imitation. In clucking this

subject we must always take into consideration the power of habit. Convulsive motions are easily repeated, readily become habitual, and will then be oft repeated when the original impression is removed.

We are now to speak of defect of motion. Here we first confine ourselves to loss of motion tho' under Paralysis loss of sense is also oft comprehended. The motion of a muscle may be hindered either by the state of the Nervous power or by various organic affections in the structure of the muscle. If from Oedema the motion of a muscle is prevented we don't call this palsy which implies an affection of the proper moving powers; hence we throw out the 3^d general cause of Paralysis as also the 2^d the state of the Arterial Circulation, for we know that this may be impaired for a very long time without affecting the motion of the muscle. We consider Palsy as an affection of the Nervous system & we must therefore in that seek for its causes. These are whatever prevents the communication by which the increased Nervous influx at every contraction is deriving to the muscle, so far that the power of Stimuli applied to the origin of the nerves or a part of the nerve superior to the place where the communication is intercepted, has no power of inducing contraction

Contraction. The causes of this interruption we readily ascribe to pressure, and very universally suppose this as the only cause; but there seem to be other causes arising from a particular state of the Sensorium, tho' what this is we don't know. We are induced to think thus because Palsy oft remains after the compressing cause is removed as we should imagine from observing that these causes are not attended with other considerable affections as should be expected. How are we to explain this? We have formerly referred sleep to a particular state of the Nerves themselves. It is very probable that whilst Compression may occasion this it may do it by that *Collapsus fistulae nem Nervorum* we spoke of; further, we find Palsy most commonly cured by Stimuli. I must now add that there is reason to believe that there are various degrees of Palsy depending on particular compression. Sydenham distinguishes Paralysis from Atonia in an ambiguous manner. We distinguish them on another foundation. Want or decay in Muscular fibres may depend on want of influx from the Sensorium or want of proper condition of the Muscles particularly Atonia. To the first of these we apply the term Palsy to the latter Atonia. Same Indistinctly occurs here.

here, since we have before said that the Tension of the Muscles depend partly on the Nervous Influx. To be more clear we would say that when it is a fault of the tonic power, this may properly be called *Sttonia*, other cases *Paralysis*. We should next go on to another subject connected with this last, the *Comni Affectiones*. Of the 4 causes here assign'd we cannot help remarking the last. Dr. Haubius has always been a warm Advocate to the Stahlian System, but seldom shows it, here however is a slight note, inferior to any of the in. This finishes the whole of the *Symptoma Motuum Animalium*.

We come now to consider the *Symptomata Motuum Vitalium*, and shall with him begin with *Symptomata Respirationis*. Of the effects of Respiration we shall consider only difficult Respiration. This may be either in Inspiration or Expiration, but 1000 times in Inspiration for once in Expiration. Its causes we refer to 3 heads 1. The condition of the Air. 2. The Obstruction of the passages thro' which the Air enters the lungs. 3. The condition of the lungs themselves. The Air may be either too rare too warm or too dense, or what amounts to the same too heavy. Having before spoken largely of the effects of Air on our bodies we don't need to say much more

this subject. The Putrefaction of the Air is always to be taken in, nor can quantity alone suffice, hence too rare or too warm air allows the blood to be accumulated in the Lungs and so gives occasion to Asthma and particularly Hemoptoe. Many difficulties occur here in all our reasoning with regard to the weight of the Air I don't believe that we should ever feel the effects of too dense Air. With regard to the diving Bell we are not acquainted with the facts and leave it as a subject of enquiry.

The next head of causes will operate in delaying the transmission of the Air which is necessary to expand the Lungs. To give an observation here we have lately had an Epidemic Angina with Scudations on the fauces giving Stagnation and much Mucus. This has given a Stertor in breathing as of difficult breathing, but the Stertor here occurred in Expiration more than Inspiration. This relieved our fears about the Glottis being affected by the swelling, and depended merely on the quickness of Expiration in comparison of Inspiration. The most general cause of difficult Respiration is from the condition of the Lungs themselves, this we have divided into two cases perhaps not properly, for

comes

11. Viet. what was before said de Macin. Atmosph. ~~to be~~ ⁱⁿ

some of the moving powers act in diminishing the proper capacity of the Lungs. The first affection of the moving powers is Spasm or Constriction, and this is proper Asthma in opposition to Dyspnoea. The causes of this may be matters introduced in the Air or other causes acting generally internally. Among these is Cold, and this is the case of Asthmaticos, who are most affected in Winter. Perhaps we should have introduced here Warm Air, since many more Asthmatics are affected in Summer than Winter, but we did not do it choosing rather to refer it to the Head of Internal Causes. Of the Aer Inguinalis we have spoke before. We must now here that a great variety of Inguinamenta may give occasion to Asthmatic Complaints tho' they do not in inducing diseases in general. We must here mention a particular Inguinamentum, Dust. A quantity of this must be taken into the Lungs, and yet we find little mischief from it, it being usually retained in some part or other of the passages leading to the Lungs.

In many cases however it doth not hurt us and Sauvages has very properly given a Dyspnoea Pulverulentum. In the 3^d place the Spasm may be induced by various internal causes acting either immediately in the Lungs or on neighbouring parts. We

the various Infarctions of the Lungs following
 here may give occasion to Spasm; hence too rare
 air by preventing the proper transmission of the
 blood may occasion Spasm, [hence too, rare air by
 preventing the proper transmissi^on] Of the powers
 acting on the Secretum Ex^o must refer to the duty
 of Spasm and Convulsion.

The next head we have inserted on the Authority of
 Sauvages. I think the Lungs may be affected with
 Caly. In an Hemiplegia the intercostals of one side,
 one would expect to be affected and perhaps too
 one lobe of the Lungs; but in most cases of Hemi-
 plegia not only the Lungs but intercostals are not
 affected in consequence as it should seem of the
 constancy of the vital motions, tho' on what this
 depends is not well known; we have seen cases
 where the Lungs were also affected. It is doubtful
 whether we can admit the Dyspnoea Spasmodica of
 Sauvages. More particularly is expiration affected,
 but without being attended with any great incon-
 venience. We would observe on this that there may
 be degrees of Caly; thus the Respiration is render-
 ed more slow in several comatose states and some-
 times almost entirely stop'd. various other causes of
 debility in general affect Respiration, hence all
 weak

weak persons cannot bear sudden motion they not
being able to transmit the blood as fast as it is
sent to them. This seems to be the case in the Dyspnea
Scorbularum. We have added a 4th head of which
we have instances in Pleurisy and Eripneumonia,
as also in Hepatitis &c. We come now to the 2^d head
of causes which we have again divided into 3^d
obstruction of the Lungs themselves and compression
without them. This is not proper if the term Obstruc-
tion is used in the sense we before gave it. By
it here we mean the Effusions of fluids. The sub-
divisions belong properly to the head of Effusion
and are of three kinds. The first is of Humors effused
into the Bronchia, Gaubius in enumerating the fluids
that may be effused, mentions the Lympha, Chylus,
Sanguis &c. But we know nothing either of the
cases of these or of their possibility. With regard to the
2^d head we must observe that it is connected with a
case which we have not touched here. I imagine
that it is rather an effusion or concretion than an
injection. Dr Kraaw gives a case of a matter spit up of
the exact figure of the Trunk and branches of the
bronchia. Of the next head the first subdivision is
Plethora. I would wish to have added the Sily. but
his

223.
this and Plethora have the same effects. It is to be
observed that Independant of general Plethora
there is oft a topical Accumulation in the Lungs
as in the cold fit of all fevers. The 2^d head requires
no Comment. The 3^d would have admitted of fur-
ther subdivision as it comprehends the noted case
of Tubercles. Pleura may be understood to be a
consequence of this and the Inflammatory State.
By the first instance of Compression here given
we meant to express a case which lately occurred
to us of a tumour as large as an hen's egg found
at the division of the Trachea. The proper
instances of the second is the Hydrops Pericardii.
The proper cases of the 4th are Empyema & Hydro-
thorax. The instances of Conformatio mala may
be found in Sauvages under his Dyspnoea Rachitica.
I must observe of this here that Sauvages has multi-
plied his species far beyond what is necessary
which particularly appears in this case of Dyspnoea
which is very seldom a primary affection, yet is
divided into a great number of species by him.

We proceed now to the next head of Spasms. There
is no occasion to treat here of Palpitation and tre-
mor, for they cannot be understood but from the
Doctrine of Spasm of which this is the best illus-
tration

tration. We proceed to another symptom of the
Cardis Motus, viz, Arteriarum Pulsus. Shall enter
here into the nicer distinctions of our Systematics
on this head. We shall consider first the state of
frequency of the Pulse.

We must here premise, that we consider only pro-
perly the Action of the Ventricles of the Heart, which
are synchronous, so that whatever acts on the
same brings the other into consent. The action of
the ventricles depends either on the Influx of ve-
nous blood or influx of Nervous power. It is not
necessary to determine whether at every contrac-
tion a fresh influx is sent from the Sensorium
or the Tonic power in the Muscles is sufficient.

1. With regard to the venous blood it is obvious that
this is the chief and ordinary stimulus to the
Heart's contraction, and therefore if poured more
quickly into the Heart the Heart's contraction
will be quickened. Hence Muscular Exercise or
quickened respiration will increase the frequency
of the Pulse, so will whatever quickens the general
circulation. This will depend much on the proportion
of the system of vessels to the heart itself, and to this
we refer the difference of frequency of pulse in
different

different Ages. The velocity of the venous blood
 being given if any cause prevents the entire emp-
 tying the ventricles this will occasion the venous
 blood to fill the heart sooner and so quicken the
 contraction. This may be of two kinds first the weak-
 ness of the ventricles from any cause, hence it is in
 part that a weak and frequent pulse are so oft
 combined. The 2^d is any resistance in the passage
 from the lungs, spasm &c. This resistance is
 more frequent to the right ventricle from the va-
 rious obstructions in the lungs, and from the
 various modifications of Coughing, laughing &c.
 These however act in a double way since they also
 impede the motion of the venous blood. It is probably
 to obviate these causes that the right ventricle is
 larger than the left. We come now to the 2^d cause
 of frequent contraction the state of the nervous
 power. This depends, first, on the heart's irritabi-
 lity. We may observe that whenever we find
 general Irritability of the System there is com-
 monly a quickened pulse. Whether this is always
 connected with general Irritability of the System
 is not certain. The state of the Lungs, however may
 be opposed to irritability, hence we may explain
 the

Q^d It is ambiguous whether these are to be referred to
Nervous Influx or to (Sonic) Power only.

the slowness of pulse in persons otherwise strong and healthy. As firmness of Tonic power thus gives a slow pulse, Atonia must quicken contraction. This is done, first by giving Irritability. By this increased irritability from Atonia and also by its preventing the proper depletion of the ventricles it gives a quickened pulse, yet in some cases Atonia seems to go the length of Torpor and Insensibility. Tho' Atonia then may be considered as residing in the muscular fibres yet it is connected with the energy of the Sensorium. (The several passions of the mind give a strong proof of this. These are the effects of the State of the Tonic power. Now to speak of such as are to be referred to it's influx; among these are Stimuli applied to the heart itself. It is to be enquired here whether there are any such peculiar Stimuli, and what they are. Heat is commonly reckoned such, but, as it should seem, improperly. — For supposing Heat generated elsewhere yet from communication it can have little effect. But every increase of heat in the system must in general, prove a Stimulus and excite frequent contraction. Another supposed Stimulus is intestinal motion of

227.
of our fluids. There may be such but a very quick
one and not capable of stimulating the heart or
vessels, at best it is quite Sympathetic. When
this and frequency of pulses are combined they both
probably depend on the same cause. If this be
such effects it may be from matter generated
thereby. This leads to the third supposition of sti-
mulus from various acrid matters either brought
from without or generated within the body. We
must observe of this that this is one of the possible
suppositions tho' not very probable, or allowing
it's probability we scarce know when these stimuli
operate. There is always present in our Mass of
blood acrid matter which affects various actions,
but this doth not affect the circulation, which leads
to the supposition that the inner coats of vessels
are not so very sensible. Acrimony is also oft
present of a natural kind but in a much higher
degree without affecting the circulation, so we
before instanced in the case of Urine or Urinous
matter circulating in the Mass of blood as also of
bile without affecting the action of the heart or
vessels. In the Scurvy the blood is in a very acrid
state, but oft there is no fever here present. we
conclude

conclude then that it is very doubtful what degree of Acrimony can stimulate the heart and therefore when this case can have place, we commonly suppose that Pus absorbed brings on fever and that by stimulating the heart. It is not altogether without reason since the exacerbation of this fever observe the two natural diurnal Paroxysms. But in opposition to this we find Pus off present in the blood without any such effect. This instance at Pus too is ambiguous; for first, there is an Inflammatory state then present, 2. Increasing the arterial Exacerbations it acts like all the other direct causes of fever by bringing on a cold fit so that it doth not seem to act as a direct stimulus to the heart. It is allowed that many chemical Acids irritate the heart, but it is doubtful how soon what quantity they can arrive at the heart. Most of them are such as become inert on diffusion and therefore can have no effect this way. If any Acid matter then doth act directly as a stimulus to the heart in any case it must be very rarely, we shall rather find that Acid matters act by exciting pain & inflammation in other parts, and in consequence of that exciting the action of the heart. Such seems to

to be the action of Cantharides. On the whole, then the doctrine of direct Stimuli is in a great measure to be deserted. We must therefore next consider the indirect Stimuli. These are of two kinds, first, such as may be supposed to act by direct impulse exciting the nervous influence to all parts of the body and particularly to the heart, and 2^{dly} such as act by exciting fever which we have before shown to arise otherwise than by direct impulse.

We must now observe that the particulars are difficult of arrangement in these classes. The first difficulty occurs with regard to Sedatives proving Stimuli to the heart's action. We before offered a theory to explain this, or independent of that every Sedative may contain Stimulating matter; if so they will come under direct impulse, but if we admit another supposition that they only prove Stimuli by exciting the reaction of the Sensorium they should be rather referred to this head. Another difficulty is whether Stimulus, exciting inflammation always acts by direct impulse or in exciting the causes of Fever. After this to give the particulars of the first class reduced under a few general heads. In general

(a) we say we prove Stimuli here, because we only know this sometimes from Experience of their effects, thus it happens in the case of purgatives which will sometimes produce Inflammation if long applied tho' we may be insensible of their operation

all Impressions so far as they produce ^{direct} sensation, in opposition to reflex sensation, prove a Stimulus, as light, noise, &c. These in particular are aff Stimuli merely by their novelty, in other cases by the force of Impression. 2. various reflex sensations as attended with pleasure or pain. Desire or Aversion prove Stimuli; pleasure, bodily pain, & desire may in general be reckoned Stimuli. The sedatives are to be found in the uneasy and disagreeable Impressions & those exciting Aversion. All such as do or will ~~excite~~ inflammation in the part to which they are applied prove Stimuli. The purgatives by their operation prove Stimuli & by their effects only discover this. Lastly sedative Impressions in their first operation. Of the 2^d Set of Stimuli, producing Febr, they are Contagion, Cold, Heat, Theorrhagica Molimina and febrile congestions. This gives the whole of the causes respecting the frequency of the Pulse. The other considerations respecting different states of the pulse we chuse to pass over. We are inclined to admit of the distinction between the Pulsus Celer and frequens. Another

Another view of the pulse as Intermittent or 231.
Irregular. This will be the whole of Palpitation
to be referred to the doctrine of Spasms & Convulsion.

With this we finish our observations on
Pathology, and we shall now proceed to our 3^d
part viz, Methodus Medendi.

FINIS.





